commodore power/play

home computing

Spring 1984, Volume III, Number 1
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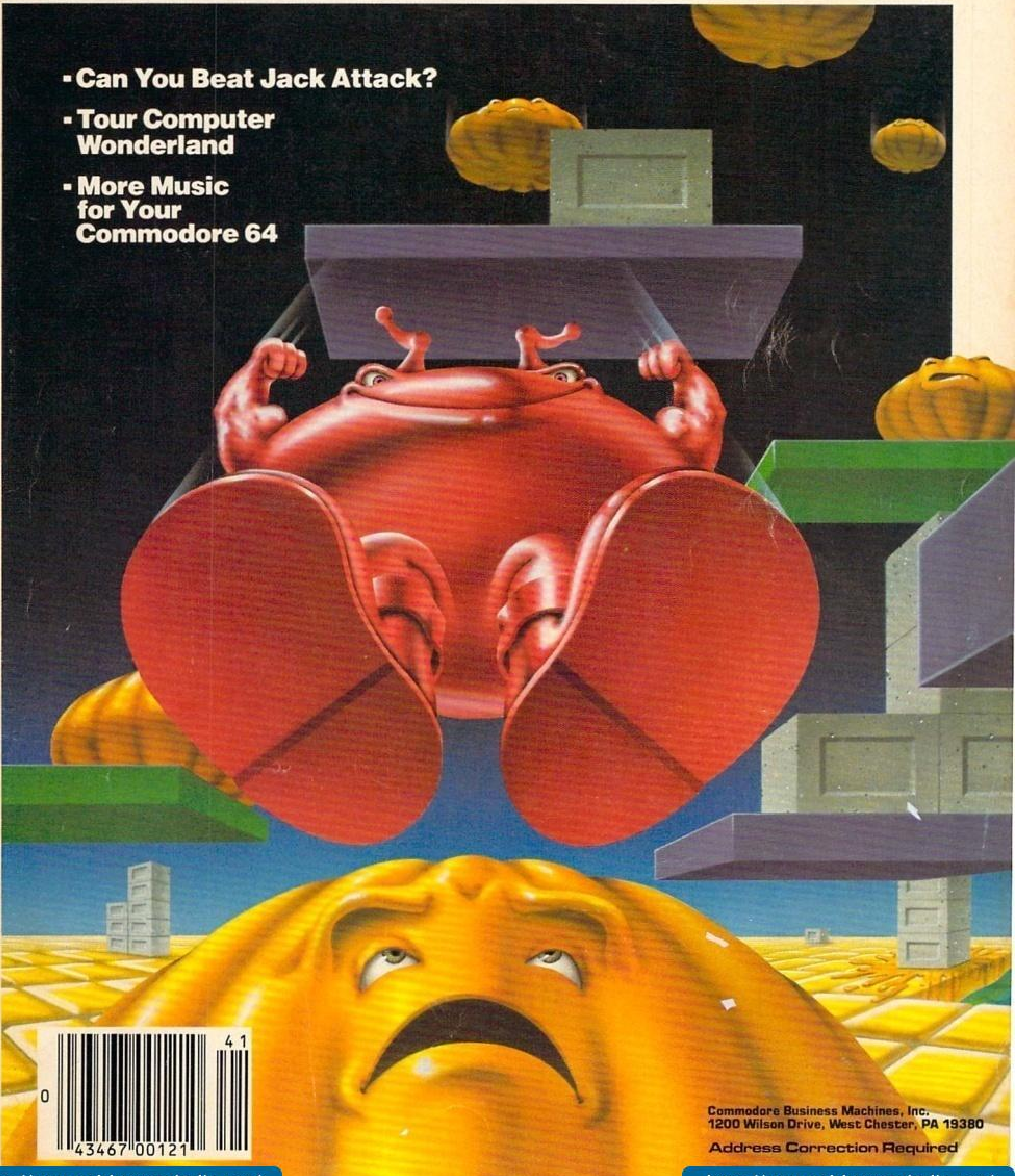

- Can You Beat Jack Attack?
- Tour Computer Wonderland
- More Music for Your Commodore 64

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1200 Wilson Drive, West Chester, PA 19380

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KICKMAN
SEA WOLF
GORF
BLUEPRINT
LAZARIAN
commodore

...Take on the world, toughen up your trigger finger and fire away...

Commodore is the best computer value in town...at home, at school and at work... with our exciting, easy to use, inexpensive VIC 20 and C64 computers.

We're fast becoming the best game in town when it comes to entertainment for the whole family...and at affordable prices.

THE BEST ARCADE IN TOWN can be in your own home with our exciting, faithful reproductions of the best of Bally Midway arcade games. Our **Kickman,** (which just received a coveted "Electronic Games" award for an arcade translation) lets you steer the unicycle to catch the falling objects, as they fall quicker and quicker!!

Gorf, Lazarian, and Omega Race give you the best in classic space action against the one-eyed leviathon, the droids or the evil Empire.

In **The Wizard of Wor** you attempt to defeat the Wizard and the Warriors, fighting your way through to the end. With the new Commodore "MAGIC VOICE"... It talks back to you too!!

You commandeer the fleet at sea with our version of **Seawolf,** and become the master tactician as you battle "it out" with enemy fleet.

Clowns and **Blueprint** round out our arcade entertainment package to keep your fingers nimble and your mind in gear.

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COMPUTERS

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See your local dealer now... He's got the best game in town... just for you.

AT LAST!!! A REAL FLIGHT SIMULATOR!!!

— From The Creators of HELLCAT ACE!

A real flight simulator allows you the pilot to accomplish Takeoffs, Landings, Cross-Country Navigation, and Emergency Procedure practice under Clear (VFR), Cloudy (IFR), and Cross-Wind conditions. SOLO FLIGHT is such an advanced simulation that uses realistic three dimensional terrain graphics, actual configuration instrument panel, multiple air navigation maps, and accurate aircraft performance characteristics to provide the challenge, thrill, excitement, and joy of the flight experience!!!

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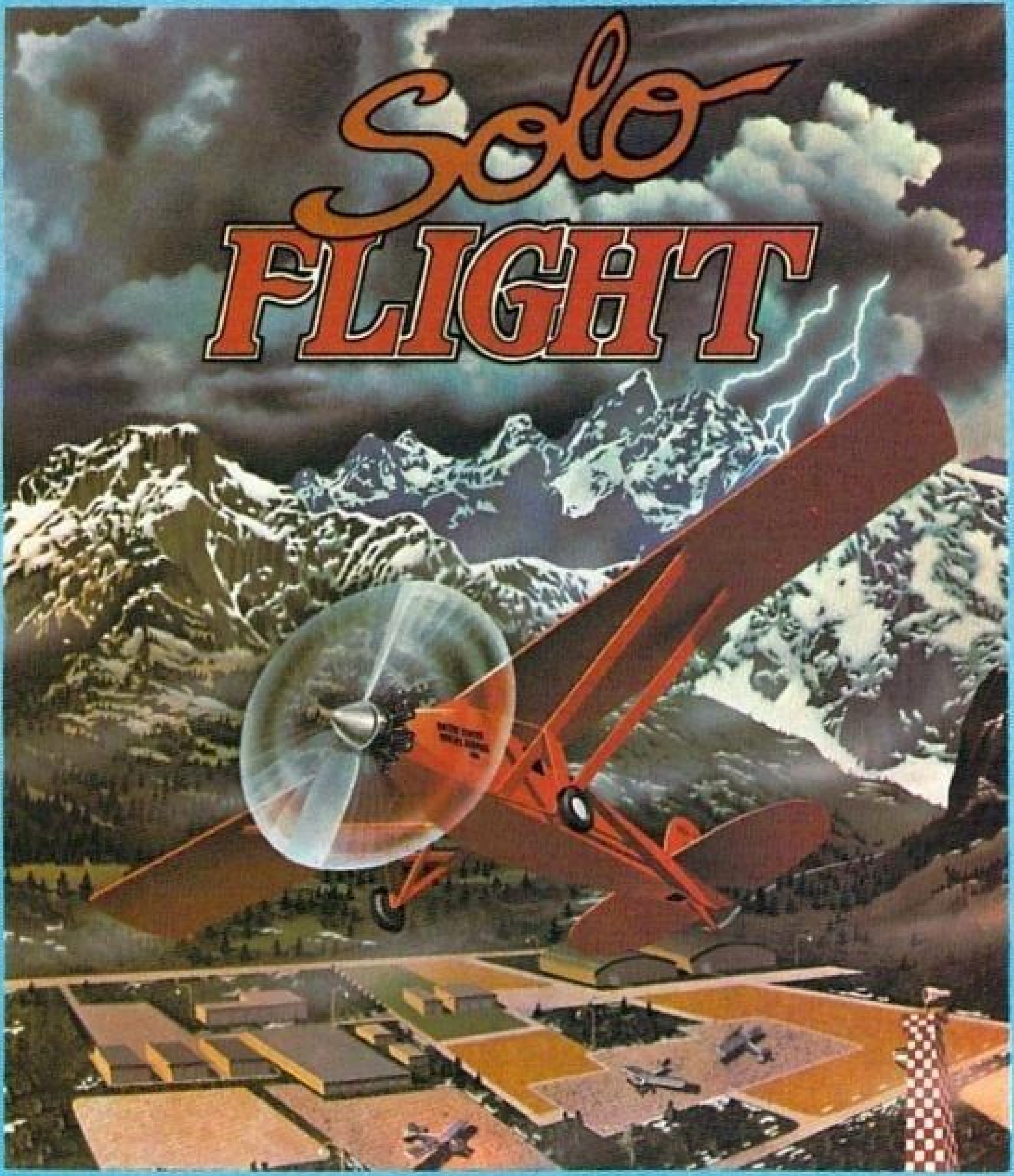
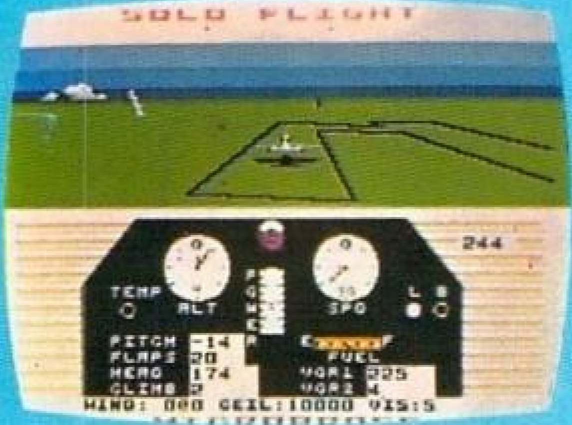
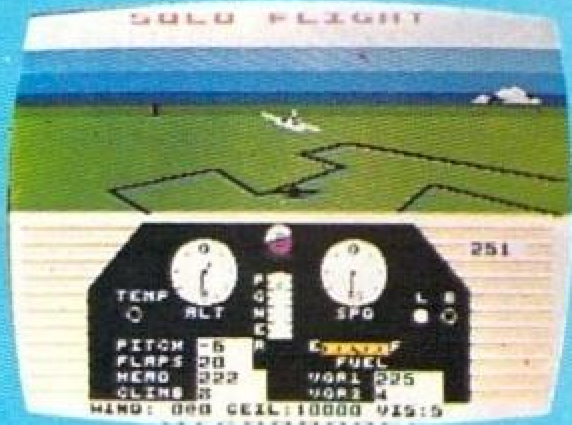
- Multiple Airports and Runways
- Dual Radio Navigation Instruments
- Full Feature, Actual Configuration Instrument Panel
- Multiple Air Navigation Charts
- Instrument Approaches


Solo
FLIGHT

- Takeoffs
- Landings
- Cross-Country Navigation — Day, VFR and IFR Flying
- Emergency Procedures Practice
- Air Mail Delivery Game for 1-4 Players
- Smooth Landing & Good Navigation Scoring
- For All Atari and Commodore 64 computers, disk or cassette . . . $34.95
- Coming Soon for IBM-PC


SOLO FLIGHT
244
TEMP
ALT
SPD
PITCH -14
FLAPS 20
HEAD 174
CLIMB
FUEL
VOR1 225
VOR2
WIND: 000 CEIL:10000 VIS:5


SOLO FLIGHT
251
TEMP
ALT
SPD
PITCH -5
FLAPS 20
HEAD 222
CLIMB
FUEL
VOR1 225
VOR2
WIND: 000 CEIL:10000 VIS:5

Look for MicroProse's two new exciting real time combat simulations — MIG ALLEY ACE & NATO COMMANDER.
Write or call for our Free Catalog.

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Commodor
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home computing

Jack's Almanac

Computer Wonderland

SE Composer

features

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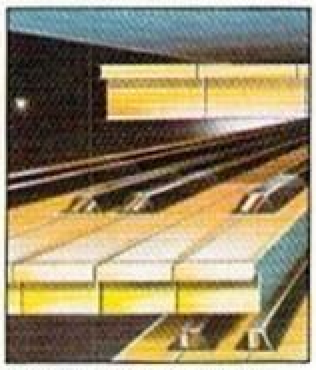

SID Parameters Table

65 **The Commodore Challenge Contest**
Type and save this month's winner, *Tunnel 2* by Matt Cisternino. Then fill out the entry blank and send a copy of your best for the VIC 20. Maybe you'll be our next winner!

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Coming Next in Commodore's User Magazines

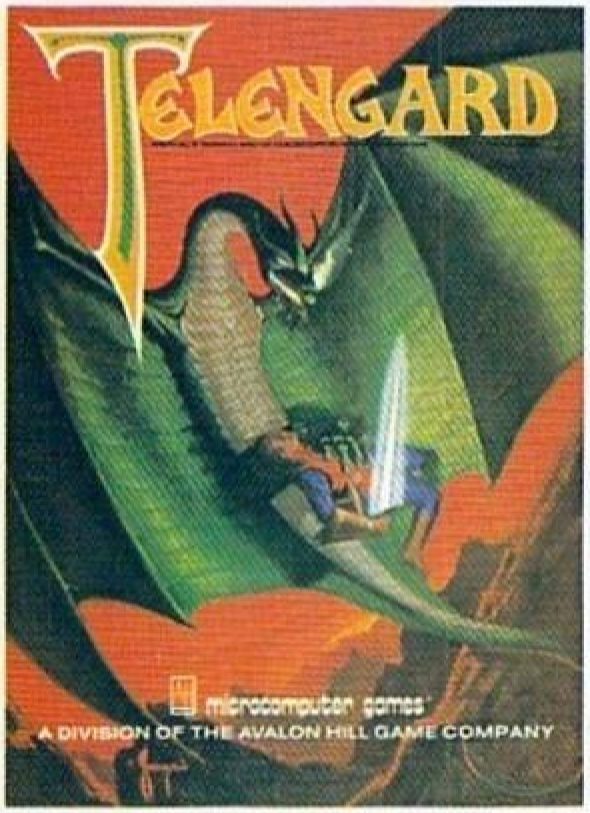
Commodore: The Microcomputer Magazine. Issue 29: Our next issue will feature Computer Literacy — and how to get it. Where do you turn when you want to really get into the nuts and bolts of using your computer? What should you look for — and avoid? Find out in April.

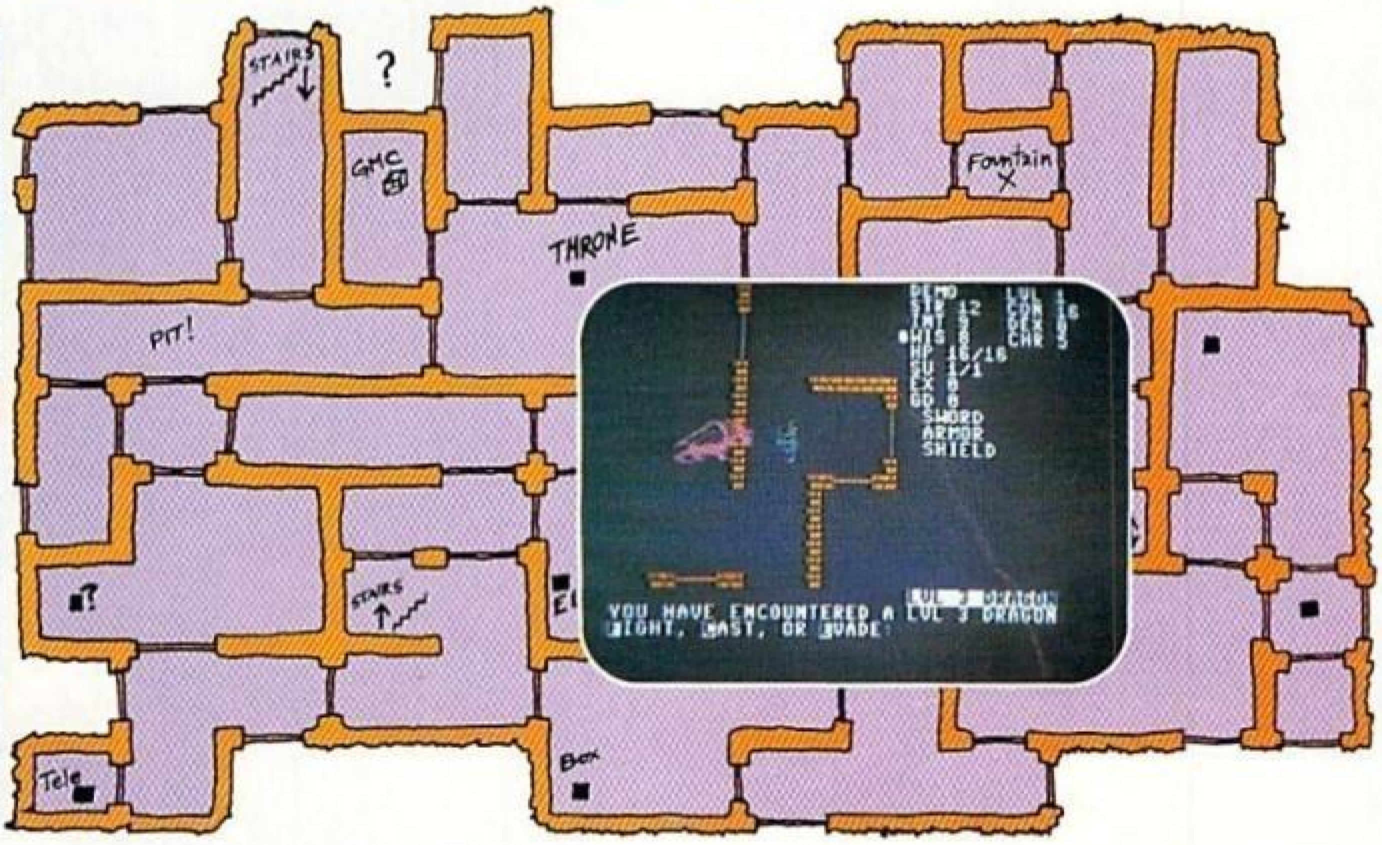
Power/Play: Now that Power/Play is going bimonthly (see Braindrops, this issue), you can look forward to even more fun and games than ever before — plus more about the Commodore kids, more programs, more indepth game reviews and a new look that will knock your eyes out!

Key to Entering Program Listings

```
"[F1,F2,F3,F4,F5,F6,F7,F8]":F1,F2,F3,F4,
  F5,F6, F7 AND F8
"[POUND]":ENGLISH POUND
"[PI]"PI SYMBOL
"^":UP ARROW
"[HOME]":UNSHIFTED CLR/HOME
"[CLEAR]":SHIFTED CLR/HOME
"[RVS]":REVERSE ON
"[RVOFF]":REVERSE OFF
"[BLACK,WHITE,RED,CYAN,MAGENTA,GREEN,BLUE,
  YELLOW]" THE 8 CTRL KEY COLORS
"[ORANGE,BROWN,L. RED,GRAY 1,GRAY 2,L.
  GREEN,L. BLUE, GRAY 3]":THE 8
  COMMODORE KEY COLORS (ONLY ON THE 64)
GRAPHIC SYMBOLS WILL BE REPRESENTED AS
  EITHER THE LETTERS SHFT (SHIFT KEY) AND
  A KEY:"[SHFT Q,SHFT K,SHFT V,SHFT T,
  SHFT L]"
  OR THE LETTERS CMDR (COMMODORE KEY) AND
  A KEY:"[CMDR Q,CMDR H,CMDR S,CMDR N,
  CMDR O]"
IF A SYMBOL IS REPEATED, THE NUMBER OF
  REPITITIONS WILL BE DIRECTLY AFTER THE
  KEY AND BEFORE THE COMMA:"[SPACE3,
  SHFT S4,CMDR M2]"
```

Be Amazed!


TELENGARD
microcomputer games
A DIVISION OF THE AVALON HILL GAME COMPANY


STAIRS
?
GMC
Fountain
THRONE
PIT!
?
STAIRS
Tele
Box

```
SWORD
ARMOR
SHIELD
YOU HAVE ENCOUNTERED A LVL 3 DRAGON
FIGHT, CAST, OR EVADE
```

Telengard: How low can you go?

We've created a subterranean monster. Fifty stories low.

That's the number of levels in the TELENGARD dungeon.

Each labyrinthine level holds hundreds of dark chambers and tomb-like corridors for the mighty adventurer to explore. It goes without saying that a shifting collection of hideous monsters with unpredictable behavior patterns can make life in the TELENGARD maze quite interesting—and frequently quite short!

Using wits, magic and true grit, your character delves deeper and deeper into the depths of TELENGARD in this realtime fantasy role-playing game. Available on cassette for Commodore 64™ and PET® (32K) for a ghoulish $23.00. Diskette for Commodore 64™ available also, for $28.00.

AND FOR THOSE WHO DON'T DIG UNDERGROUND GAMES . . . There's **B-1 NUCLEAR BOMBER**, a nail-biting solitaire simulation of a manned B-1 on a mission over the Soviet Union. Your plane is equipped with six Phoenix Missiles, a one megaton warhead and orders to retaliate! Cassette for Commodore 64™, PET®, VIC 20™ (16K) are available for an explosive $16.00. Commodore 64™ diskette available for $21.00.

NUKEWAR: Defend your country by massive espionage efforts, or by building jet fighter bombers, missiles, submarines and ABM's. Your cold and calculating computer will choose its own strategy! Cassette for Commodore 64™, VIC 20™ and PET® (16K) for just $16.00.

FOOTBALL STRATEGY: A head-to-head challenge or solitaire as you select the best offensive or defensive plays in response to your opponent. Commodore 64™ cassette for $16.00. Diskette available for $21.00.

T.G.I.F.: Thank Goodness It's Friday! Avalon Hill's new party game for one to four players recreating an often-not-so-typical week in the lives of the working class. Half the fun is just making it from Monday to Sunday. Commodore 64™ cassette available for a meager $20.00. Diskette for $25.00.

Midway Campaign, Moon Patrol, Flying Ace and **Bomber Attack** are more terrific games available from Avalon Hill's Microcomputer Games for your Commodore 64™ home computer.

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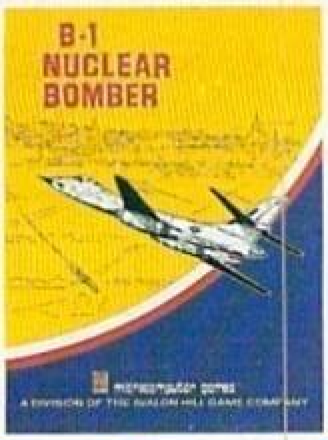
B-1
NUCLEAR
BOMBER
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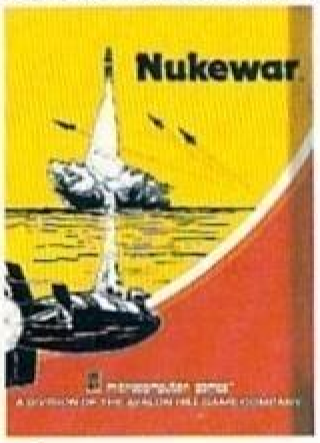
Nukewar
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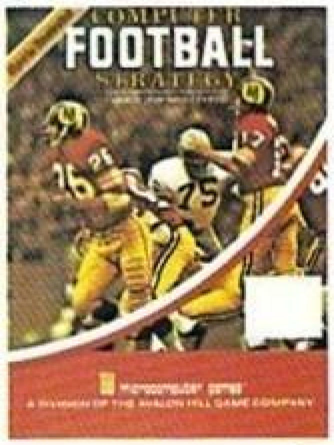
AH
QUALITY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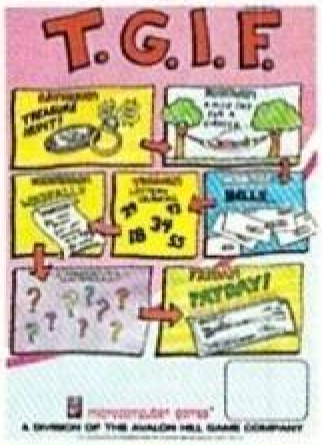
T.G.I.F.
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PAYDAY!
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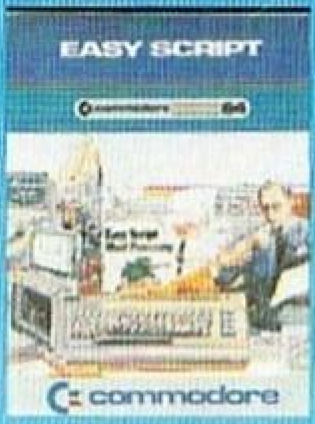
commodore 64

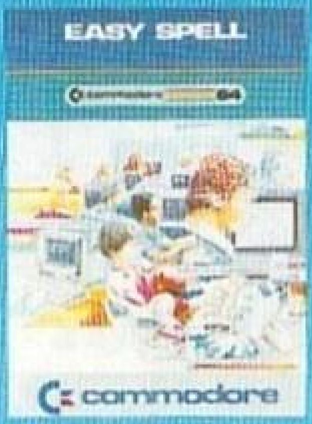
INDISPENSABLE SOFTWARE

For Your Most Important Computing Needs

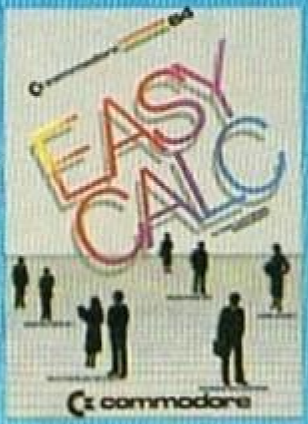
Commodore is your best value in practical software—just take a look at the programs shown here—we've got everything from wordprocessing to business accounting, from electronic spreadsheets to computer graphics. Use the Software Selection Guide to find the programs which best meet your needs, then see your Commodore dealer!



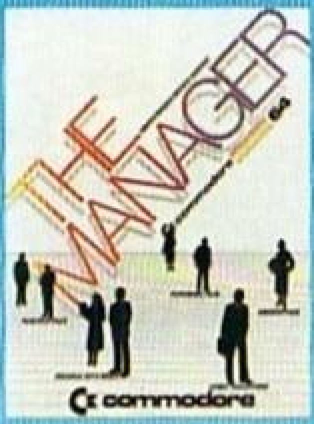
EasyScript 64
Displays 764 lines × 240 characters. Prints to 130 columns. Works with EasySpell 64.



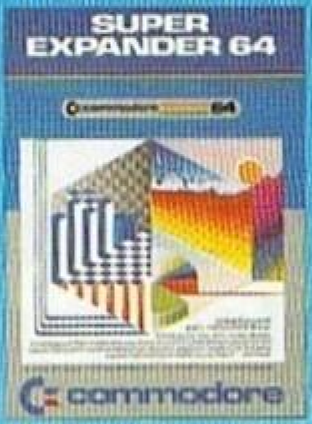
EasySpell 64
20,000 word Master Dictionary and automatic spelling checker. Works with EasyScript 64.



EasyCalc 64
Multiple electronic spreadsheet with color bar graph feature. 63 columns × 254 rows.



The Manager
Sophisticated database system with 4 built-in applications, or design your own. Text, formulas, graphics.



SuperExpander 64
21 special commands. Combine text with high resolution graphics. Music and game sounds.

Easy Finance I—Loan Analysis
12 loan functions. Bar graph forecasting as well as calculation.

Easy Finance II—Basic Investment Analysis
16 stock investment functions. Investment bar graph.

Easy Finance III—Advanced Investment Analysis
16 capital investment functions. Bar graphs.

Easy Finance IV—Business Management
21 business management features. Bar graphs.

Easy Finance V—Statistics and Forecasting
Assess present/future sales trends with 9 statistics and forecasting functions.

Accounts Payable/Checkwriting
11 functions. Automatic billing. 50 vendors/disk.

Accounts Receivable/Billing
11 billing functions. Printed statements.

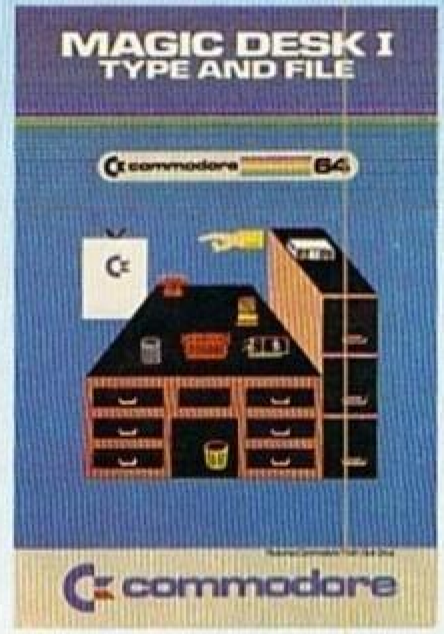
General Ledger
8 general ledger options. Custom income statement, trial balances, reports.

Inventory Management
1000 inventory items. Full reports.

Payroll
24 different payroll functions. Integrated with G/L system.

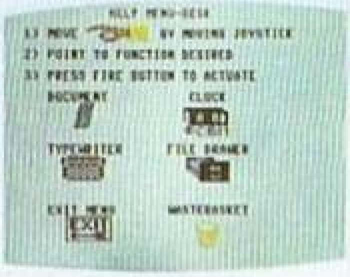
SOFTWARE SELECTION GUIDE

APPLICATION	SOFTWARE
Budget/Calculation	EASYCALC 64
Business Accounting	ACCOUNTS PAYABLE/CHECKWRITING, ACCOUNTS RECEIVABLE/BILLING, GENERAL LEDGER, INVENTORY MANAGEMENT, PAYROLL
Business Management	EASYFINANCE IV—BUSINESS MANAGEMENT
Children's Programming	ZORTEK & THE MICROCHIPS
Cooking/Recipes	MICRO COOKBOOK
Data Base Management	THE MANAGER
Electronic Spreadsheet	EASYCALC 64
Filing/Recordkeeping	MAGIC DESK, THE MANAGER, INVENTORY MANAGEMENT
Financial Investments	EASYFINANCE II—BASIC INVESTMENT ANALYSIS, EASYFINANCE III—ADVANCED INVESTMENT ANALYSIS, FINANCIAL ADVISOR
Graphics/Sound	SUPEREXPANDER 64
Learn Programming	INTRODUCTION TO BASIC—PART 1
Loans/Mortgages	EASYFINANCE I—LOAN ANALYSIS, FINANCIAL ADVISOR
Mailing List	EASYMAIL 64
Music	MUSIC COMPOSER, MUSIC MACHINE
Programming Aids	SUPEREXPANDER 64, SCREEN EDITOR, ASSEMBLER 64
Reference Books	PROGRAMMERS REFERENCE GUIDE, SOFTWARE ENCYCLOPEDIA
Spelling Dictionary	EASYSPELL 64 (for use with EASYSCRIPT 64)
Statistics/Forecasting	EASYFINANCE V—STATISTICS & FORECASTING, EASYFINANCE IV—BUSINESS MANAGEMENT
Teacher's Aids	EASYLESSON/EASYQUIZ, LOGO, PILOT
Telecommunications	VICMODEM, AUTOMODEM, TERM 20/64, RS232 INTERFACE
Wordprocessing	EASYSCRIPT 64, MAGIC DESK, WORD MACHINE/NAME MACHINE



MAGIC DESK I-TYPE & FILE

Only Commodore brings you the magic of MAGIC DESK... the next generation of "user-friendly" software! Imagine using your computer to type, file and edit personal letters and papers—without learning any special commands! All MAGIC DESK commands are PICTURES. Just move the animated hand to the picture of the feature you want to use (like the TYPEWRITER) and you're ready to go. MAGIC DESK is the "ultimate" in friendly software!



Special "Help" Menus

Not only is MAGIC DESK easy to use... it's hard to make a mistake! Just press the COMMODORE key and one of several "help menus" appears to tell you exactly what to do next.

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COMPUTERS

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commodore 64

THE BEST GAMES IN TOWN

Arcade Action Games

Pinball Spectacular: Real pinball action and thrills. Sound you won't believe. Chutes, lights, bumpers and more.

Supersmash: Raquetball arcade classic. 3 games in 1. Many skill levels keep the challenge alive.

Tooth Invaders: Reviewed by American Dental Association. Arcade action teaches good dental care. Beat D.K. at all 9 play levels.

NEW **Star Post:** Protect the Star Post from waves of invaders. 3 levels of skill. 99 levels of action.

NEW **Avenger:** Destroy attacking aliens with laser cannons. Classic arcade action. Multi-speed attacks.

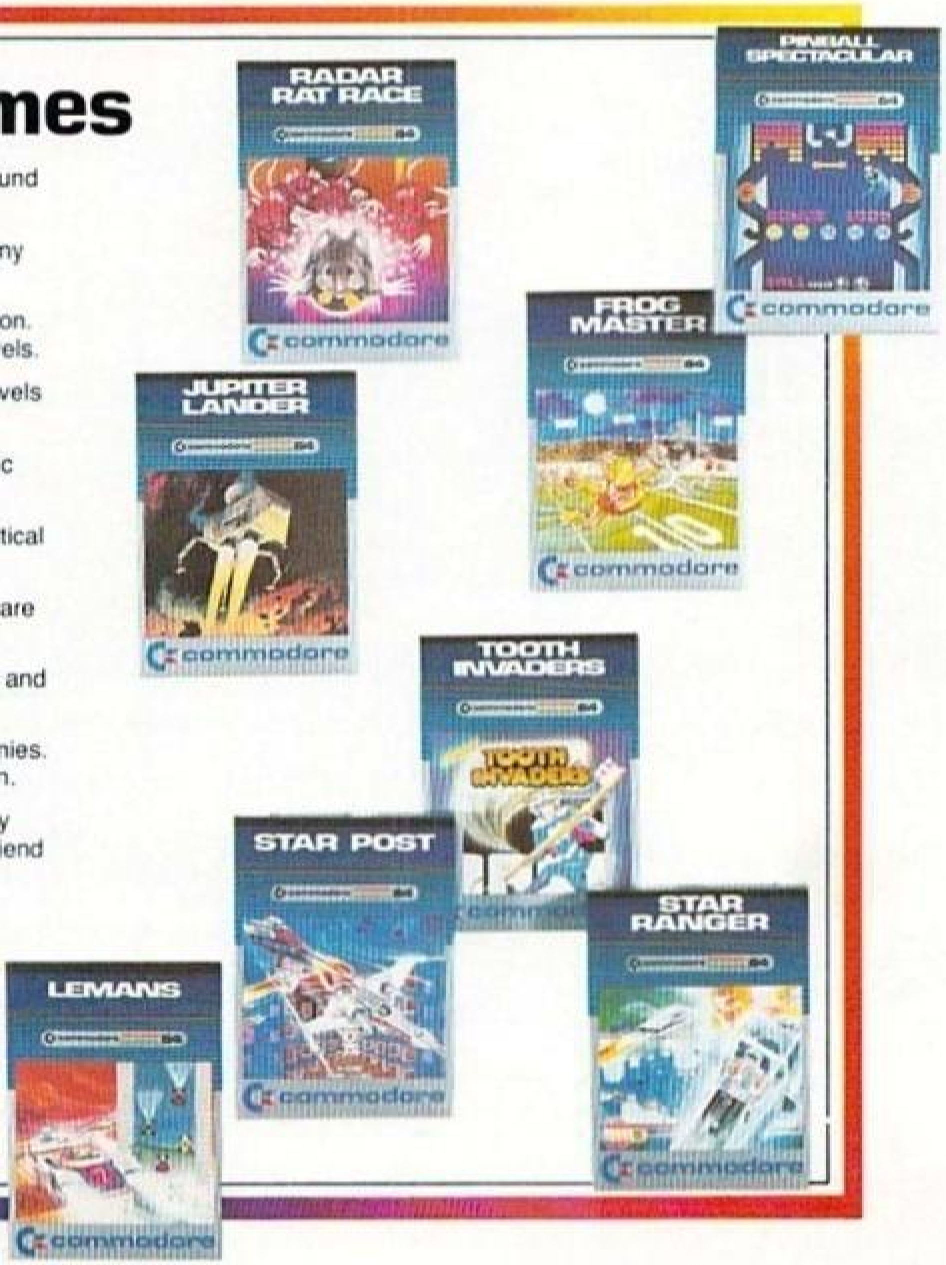
Jupiter Lander: Space landing simulation. Horizontal/vertical thrust. Soft-land scoring. Wow! animation.

Radar Rat Race: Beat the maze. Eat all the cheese. Beware deadly cats/rats. Cartoon action fun for all ages.

NEW **Lemans:** Multi-obstacle road racing at its best. Arcade action and graphics. Night, water and divided highway hazards.

NEW **Star Ranger:** Fight your way through hoards of space enemies. Avoid asteroids and land safely. Superb graphics and space action.

NEW **Frogmaster:** Unique sports challenge. Train animals to play football and rugby. Over 100 variations. Play against, computer, friend or yourself.


RADAR RAT RACE
PINBALL SPECTACULAR
FROG MASTER
JUPITER LANDER
TOOTH INVADERS
STAR POST
STAR RANGER
LEMANS
commodore

Children's Series

Introduction to Basic I: Simple step-by-step instructions. Modular design. Practical BASIC applications as you learn.

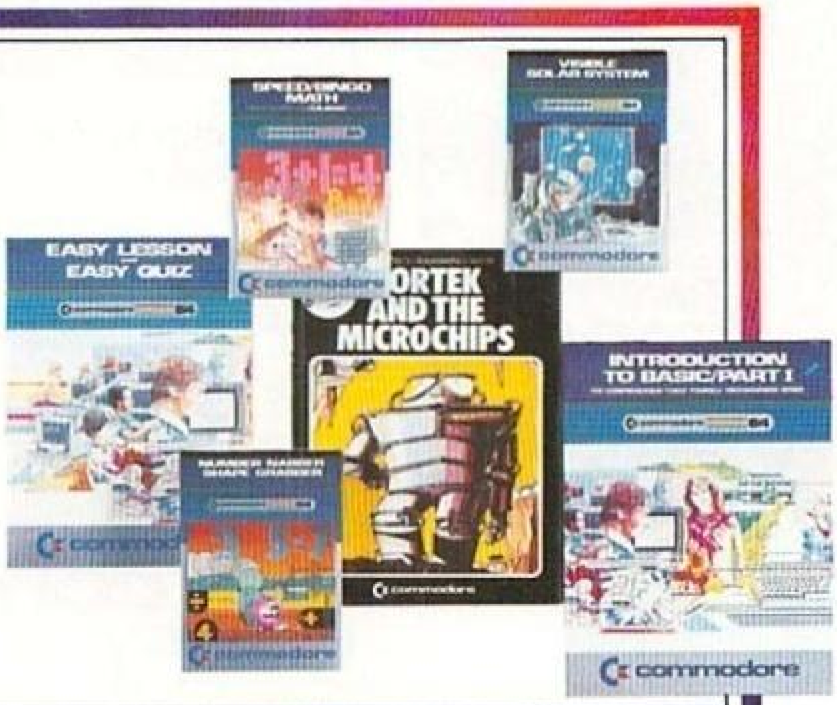
Zortek and the Microchips: Award winning program teaches children BASIC through games, graphics and stories.

Easy Lesson/Easy Quiz: Take the drudgery out of writing tests and quizzes. Answer keys provided. 7 categories per test.

NEW **Number Nabber/Shape Grabber:** 2 Learning games in 1. Build both math and object identification skills. Lively graphic and sound effects.

Visible Solar System: Fly the solar system. Land on planets. Calculate age and weight. Astronomy for home and school. Award winner.

Speed/Bingo Math: 2 games in 1 teach children 4 to 10 basic math skills. Beat the clock or your friends.


SPEED/BINGO MATH
VISIBLE SOLAR SYSTEM
EASY LESSON EASY QUIZ
ZORTEK AND THE MICROCHIPS
INTRODUCTION TO BASIC/PART I
NUMBER NABBER SHAPE GRABBER
commodore

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Bally Midway

NEW **Gorf:** 4 Space action games in 1. Fly your fighter defeat "The Empire". Multi-skill levels. IT TALKS! (with Magic Voice)

NEW **Wizard of WOR:** Fight your way through 30+ mazes. Defeat the Wizard and Worriors. Multi-skill. IT TALKS! (with Magic Voice.) Award winning conversion.

Seawolf: The classic battle at sea. Destroy PT Boats and Destroyers. Great graphics and sound.

Omega Race: Fast space race action. Many skill levels. Avoid deadly mines as you eliminate droid forces.

Clowns: Amazing action under the "Big Top". Help clowns "pop" balloons. Colorful acrobatics. Fun for all.

Kickman: Ride the unicycle and catch falling objects. Multi-skill levels. Tuneful sound. Watch out! Don't fall!

NEW **Blueprint:** Help J.J. build the "Ammo Machine". Parts are stored in a colorful maze of houses. Multi-skill and difficulty levels.

NEW **Lazarian:** 4 different screens. Multi-skill level space action. Rescue, evade obstacles and destroy a one-eyed leviathan.

KICKMAN
WIZARD OF WOR
BLUEPRINT
GORF
CLOWNS
LAZARIAN
OMEGA RACE
SEA WOLF
commodore

Adventure Games

Zork I: Fantasy adventure in a dungeon. Find all the treasure and escape alive.

Zork II: This dungeon adventure dares you to find treasure and secret places and still survive.

Zork III: The ultimate dungeon test. Discover the Dungeon Master's secret purpose and come out alive.

Suspended: Awake in 500 years. Solve varied real and original puzzles to save the planet from total destruction.

Starcross: Travel through the mystery ship. Meet aliens friend and foe. Face the challenge of your destiny. Map of galaxy included.

Deadline: Find the murderer and solve the mystery all in 12 hours. Inspector casebook and evidence included.

ZORK I
STARCROSS
DEADLINE
SUSPENDED
ZORK III
commodore

Music Series

Music Machine: Play piano or organ melodies and percussion rhythms together. Music staff shows notes on screen. Vibrato, tempo and pitch controls.

Music Composer: Create, play and save your tunes easily. Simulates up to 9 instruments. Notes appear on screen. Play your keyboard like a piano.

MUSIC MACHINE
MUSIC COMPOSER
commodore

commodore
COMPUTERS

First In Quality Software

commodore

VIC 20

SUPER SOFTWARE SAVINGS

Bally Midway

Gorf: 4 Space action games in 1. Fly your fighter defeat "The Empire". Multi-skill level.

Seawolf: The classic battle at sea. Destroy PT Boats and Destroyers. Great graphics and sound.

Omega Race: Fast space race action. Many skill levels. Avoid deadly mines as you eliminate droid forces.

Clowns: Amazing action under the "Big Top". Help clowns "pop" balloons.

Lifestyle Series

Quizmaster: Write and give your own quizzes. Teach, revise, test and entertain.

Know Your Child's I.Q.: 3 Comprehensive tests. 100 questions. Auto and tamperproof scoring. Improve school test performance.

Know Your Own I.Q.: 4 I.Q. tests. 160 problems. Auto and tamperproof scoring. For hours of entertainment.

Know Your Personality: 3 In-depth personality tests. 450 questions. Auto scoring. Find your friends true feelings. For entertainment only.

Robert Carrier's Menu Planner: 120 meals and 20 wines start your menu data-base. Add your own recipes.

KNOW YOUR CHILD'S IQ
KNOW YOUR OWN PERSONALITY
KNOW YOUR OWN IQ

Children's Games

The Sky is Falling: Pre-school and elementary age children help Chicken Little. Builds hand-eye coordination.

Mole Attack: Bop the nasty moles as they stick heads out of burrows. Cartoon graphics. Multi-speed action.

Home Babysitter: Building blocks teach the alphabet. Common objects teach numbers to 20. Plus funny face maker.

Visible Solar System: Fly the solar system. Land on planets. Calculate age and weight. Astronomy for home and school. Award winner.

Speed/Bingo Math: 2 games in 1 teach children 4 to 10 basic math skills.

Business and Financial

Personal Finance: Four programs in one. Track expenses. Spending analysis. Budgets and deductibles.

Simplicalc: Electronic spreadsheet. 1200 entries. Design/repeat formulas and worksheets.

VIC Writer: Wordprocessing made simple. From 45 lines unexpanded to 1207 lines of text with 16K RAM PACK.

Money Decisions I: 7 Loan analysis functions. Principle, regular/last payment. Balance. Time period. Interest. Variable rate loan.

Money Decisions II: 9 investment functions. Future/Initial/Minimum Investment. Regular deposit/withdraw. Interest. Annuity Continuous compounding.

MONEY DECISIONS I
MONEY DECISIONS II
VIC 20
commodore

Educational Programs

Introduction to Basic I & II: Simple step-by-step instructions. Practical BASIC applications.

Zortek and the Microchips: Award winning program teaches children BASIC through games, graphics and stories.

Waterloo Basic: The original course in VIC BASIC.

Chopper Math: Challenging helicopter landing game that teaches math basics.

Easy Type: Learn touch-typing the easy way.

VIC-20
AN INTRODUCTION TO BASIC - PART 2
WATERLOO STRUCTURED BASIC
VIC 20
commodore
ZORTEK AND THE MICROCHIPS

Adventure Games

Adventureland: Fantasy adventures challenge you to get all the treasure and escape alive.

Pirate Cove: Find the long lost treasure of pirate John Silver. Uncover clues while battling foes.

Atomic Mission: Save the nuclear powerplant from destruction. Piece clues together—solve the mystery.

The Count: Make your way through the dungeon, collect treasure and kill Count Dracula.

Voodoo Castle: Find the Count of Monte Cristo and remove the deadly curse.

VIC-20
PIRATE COVE
VOODOO CASTLE
THE COUNT
ADVENTURE LAND

Arcade Action Games

VIC Avenger: Destroy attacking aliens with laser cannons. Classic arcade action. Multi-speed attacks.

Super Alien: Trapped in an alien maze, your only defense is an alien buster. Hi-speed action.

Superslot: Vegas and Atlantic City casinos come home. Real slot machine action, graphics and sound.

Jupiter Lander: Space landing simulation. Horizontal/vertical thrust. Soft-land scoring.

Draw Poker: Casino style action. Betting. Sound effects.

Road Race: Night driving challenges you to the max. 4-speed shift. Stay on course. Don't overheat.

Radar Rat Race: Beat the maze. Eat all the cheese. Beware deadly cats/rats.

Raid on Ft. Knox: Sneak gold bars past deadly panthers and back to the hideout before time is up.

Pinball Spectacular: Space action and pinball thrills combined. Lights, bumpers, and special skill bonuses.

Sargon II Chess: Challenging chess strategy classic. Multi-skill levels from beginner to advanced.

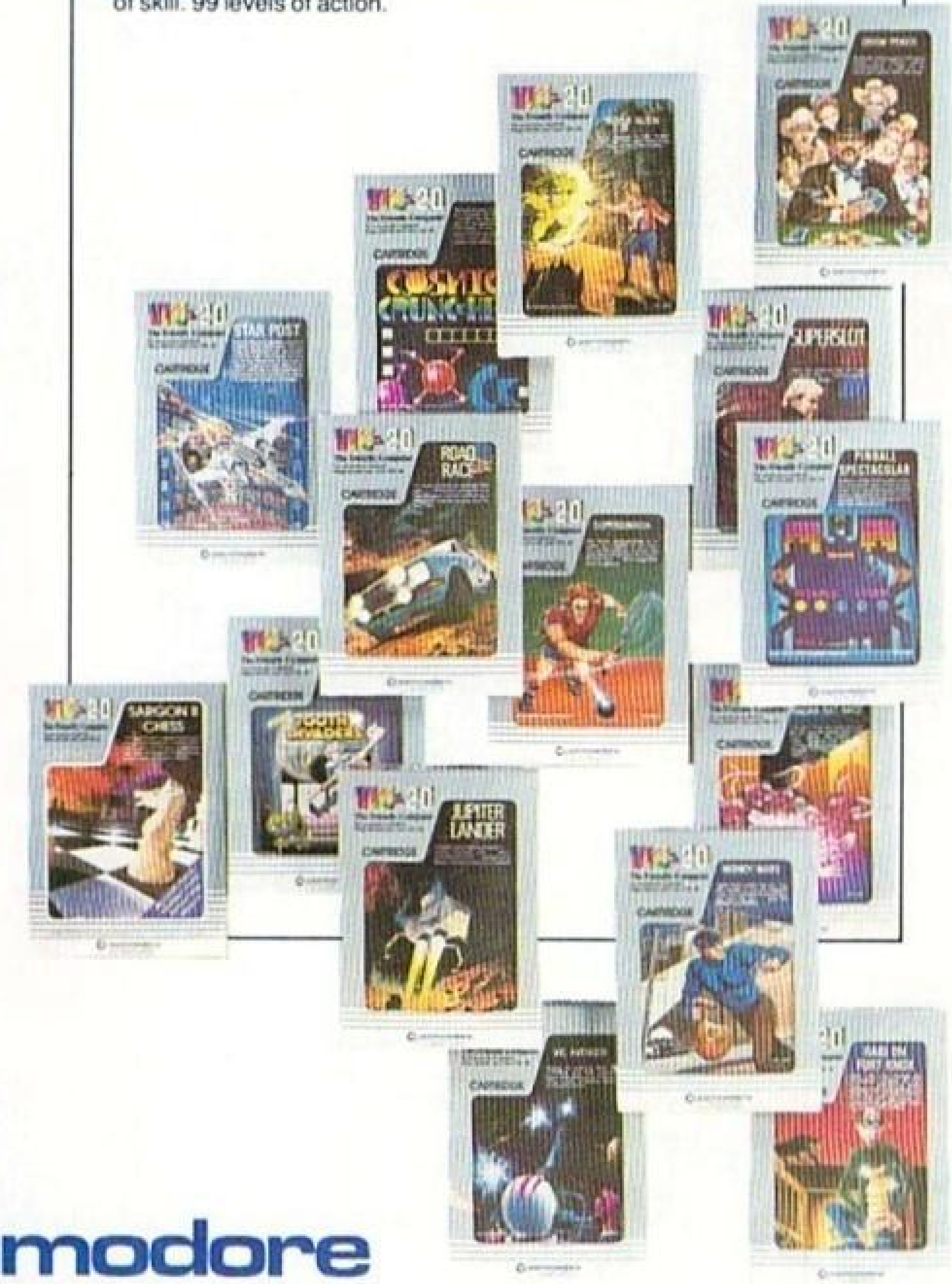
Supersmash: Raquetball arcade classic. 3 games in 1. Many skill levels keep the challenge alive.

Cosmic Cruncher: Make your way through the Milky Way. 11 levels of play. Over 300 color/maze combinations.

Money Wars: Grab the money and run. 3 brick barricades are your protection as you dodge deadly bullets.

Tooth Invaders: Arcade action teaches good dental care. Beat D.K. at all 9 play levels.

Star Post: Protect the Star Post from waves of invaders. 3 levels of skill. 99 levels of action.

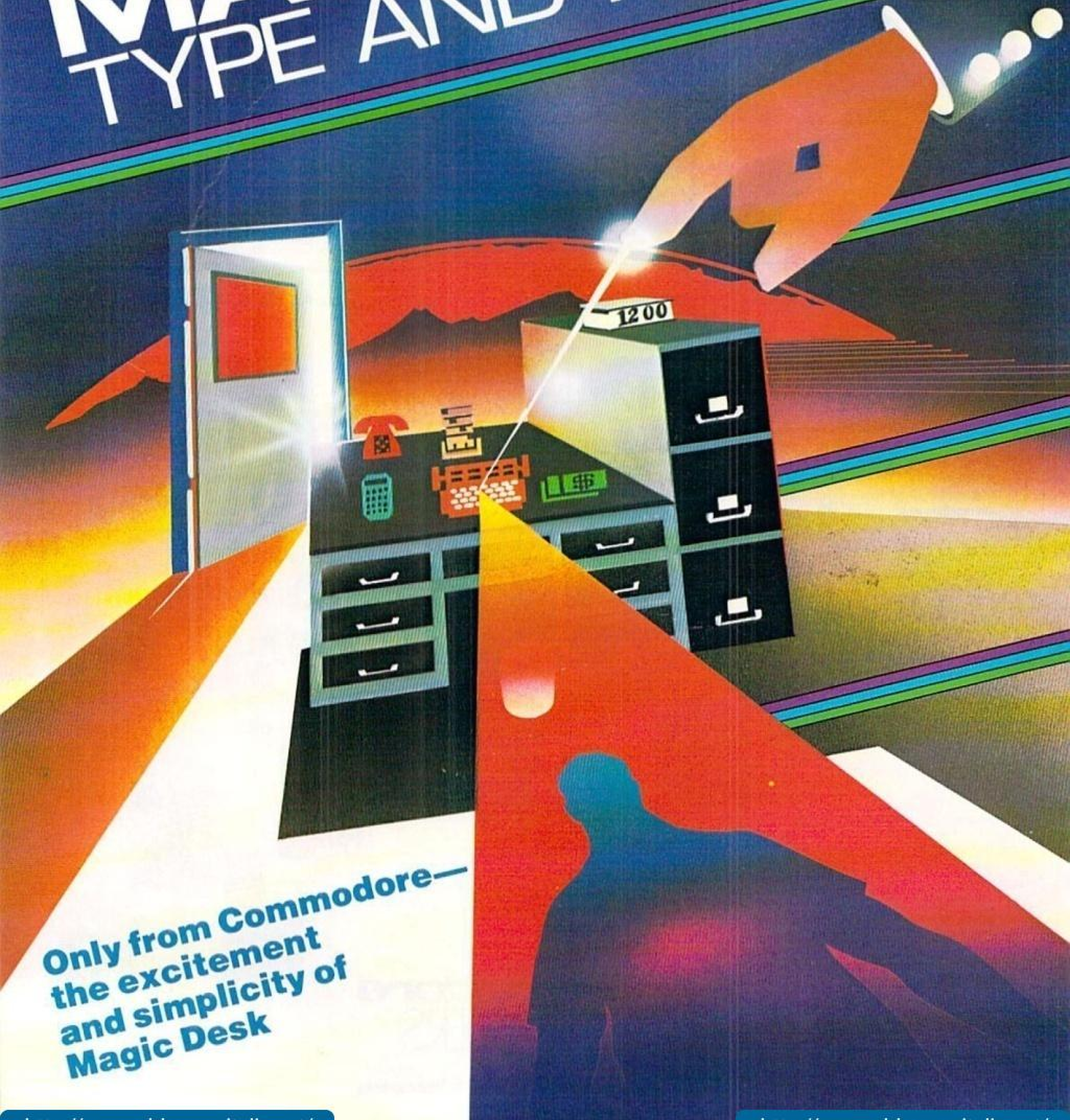

VIC-20
STAR POST
COSMIC CRUNCHER
SUPERSLOT
ROAD RACE
PINBALL SPECTACULAR
SARGON II CHESS
TOOTH INVADERS
JUPITER LANDER
MONEY WARS
VIC AVENGER
CARTRIDGE

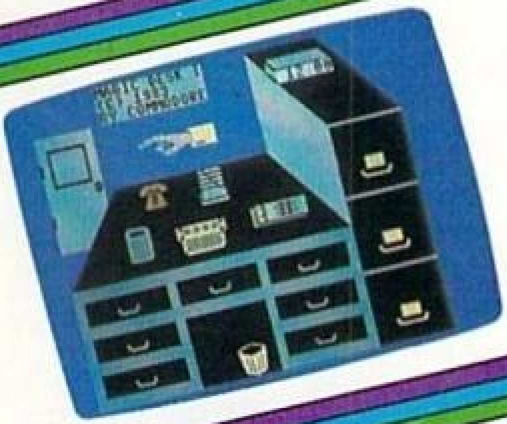
commodore
COMPUTERS

First In Quality Software

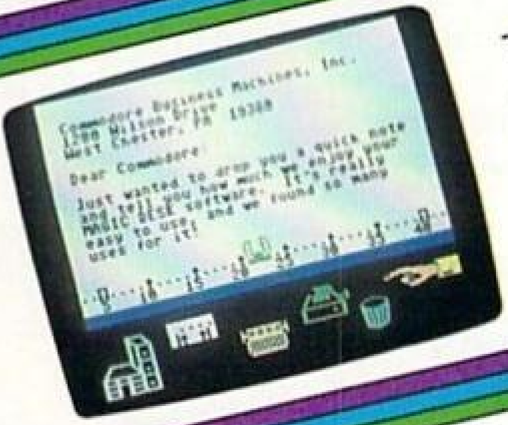
commodore 64

MAGIC DESK I
TYPE AND FILE


1200
Only from Commodore—
the excitement
and simplicity of
Magic Desk



Only Commodore brings you the magic of MAGIC DESK . . . the next generation of "user friendly" software! Imagine using your computer to type, file and edit personal letters and papers *without learning any special commands!* All MAGIC DESK commands are PICTURES. Just move the animated hand to the picture of the feature you want to use (like the TYPEWRITER) and you're ready to go.

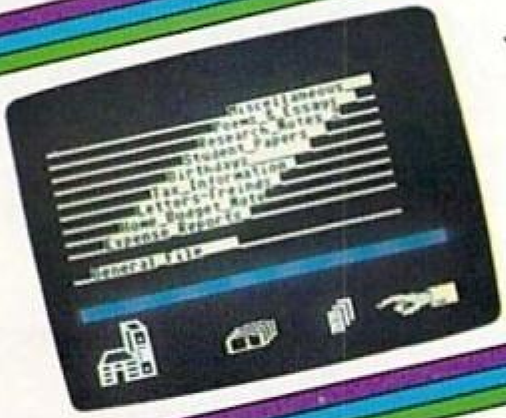


Commodore Business Machines, Inc.
1200 Wilson Drive
West Chester, PA 19380

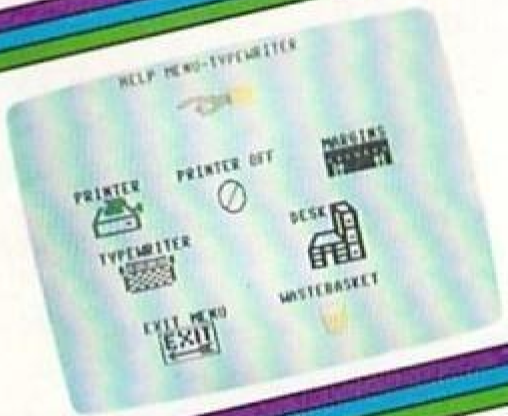
Dear Commodore:

Just wanted to drop you a quick note and tell you how much we enjoy your MAGIC DESK software. It's really easy to use, and we found so many uses for it!

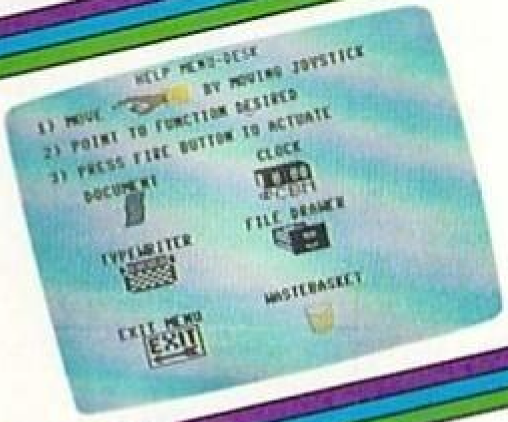
The MAGIC DESK Typewriter works just like a real ELECTRIC TYPEWRITER . . . and it's COMPUTERIZED. All the filing is *electronic*. Excellent sound effects and screen animation make typing fun, whether you're typing letters, reports or memos . . . and the built-in filing feature makes MAGIC DESK useful for keeping names and addresses, home inventory lists, insurance information and more.


Miscellaneous
Poems & Essays
Research Notes
Research Papers
Student
Birthdays
Tax Information
Letters-Friends
Home Budget Note
Expense Reports
General File

Your COMMODORE 64, COMMODORE DISK DRIVE and MAGIC DESK are an unbeatable combination. Filing operations are automatically linked to your Commodore disk drive—but you don't have to know any commands—just "file" the pages you type in the file cabinet and your text is automatically saved on diskette. There are 3 file drawers with 10 file folders in each drawer and 10 pages in each folder.


HELP MENU-TYPEWRITER
PRINTER
PRINTER OFF
MARGINS
DESK
TYPEWRITER
WASTEBASKET
EXIT MENU
EXIT

To PRINT a page you've typed, just "point" at the picture of the printer and your pages are automatically printed on your COMMODORE PRINTER or PRINTER/PLOTTER. If you want to erase what you've typed, the WASTEBASKET under the desk lets you "throw away" pages. There's even a DIGITAL CLOCK which helps you keep track of time while you're typing.



HELP MENU-DESK
1) MOVE BY MOVING JOYSTICK
2) POINT TO FUNCTION DESIRED
3) PRESS FIRE BUTTON TO ACTUATE

CLOCK
DOCUMENT
FILE DRAWER
TYPEWRITER
WASTEBASKET
EXIT MENU
EXIT

Not only is MAGIC DESK easy to use . . . it's hard to make a mistake! Just press the COMMODORE key and one of several "help" menus" appears to tell you exactly what to do next. Special messages show you how the various picture commands work and help you when you make a mistake. Help messages also show you how to use the printer, filing cabinet, digital clock and wastebasket.

commodore COMPUTERS

First In Quality Software

BUFF QUIZ!

For your Commodore 64™

How many baseball fans watched The Mighty Casey strikeout? Who was the first U.S. President to be born in a hospital? What college did Batman attend? What was the maiden name of James Bond's wife?

If you think you can answer these and other challenging questions, you might be a "whiz" at BUFF QUIZ!

BUFF QUIZ is a series of quiz games developed by educators and tested by kids and young adults. It keeps a permanent record of the top ten highest scores, providing an achievable objective for each player.

AVAILABLE ON DISK ONLY, you may order:

BUFF QUIZ 1 $20 ________
BUFF QUIZ 2 $20 ________
BUFF QUIZ 3 $20 ________

Or you can have all three for only $50. Please add $2 shipping and handling. Allow 2 to 4 weeks for delivery.

RUSH the items checked above to (Please print):

Name ________
Address ________
____
City ________
State ________ Zip ________

Send check or money order or charge to your VISA/MasterCard.

☐ Check or money order enclosed in the amount of $________
☐ VISA Card Number ________
☐ MasterCard Expiration Date ________
Phone Number ________

Signature ________
(Required for VISA/MasterCard)

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Department B
University Station
P. O. Box 2574
Thibodaux, La. 70310

VISA
master charge THE INTERBANK CARD

EDUCATIONAL SOFTWARE DEVELOPED BY EDUCATORS!

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letters

A Quick Delete for the Commodore 64 or VIC 20

To the Editor:

The absence of a DELETE command in Commodore BASIC is usually no problem. Just enter the number of the line to be deleted and [RETURN]. Deleting large chunks of a program, however, can cause you to wear out either your keyboard or your nervous system. Here is a one-line routine that may help:

```
0 PRINT"[CLEAR,DOWN3]
  "I"[DOWN]I="I+10":
  GOTO0[HOME]":END
```

Add this line to your BASIC programs when you have many lines to delete. It is not necessary to use line number 0, but if you use a different line number be sure to insert it after GOTO. Another change you can make is in the line increment, which in this case is ten. The routine will delete lines in stepwise fashion according to the increment used.

The best way to start the routine is by assigning the number of the first line to be deleted to the variable I in direct mode, as I= 100:GOTO. This sets up the screen so that two key strokes [RETURN2] are all that are needed to delete each line in sequence. The first stroke deletes the line at hand; the second stroke readies the next line. If your line numbers are fairly consistent in their spacing, your deletion task will be done in no time. **C**

Royal Jones
Warwick, Rhode Island

Foolin' Improvement

To the Editor:

I found Jim Butterfield's "Foolin' with Boolean" article in the Summer, 1983, issue very instructive, but the included program did not always work correctly. I believe I improved its operation by changing line 330 as follows:

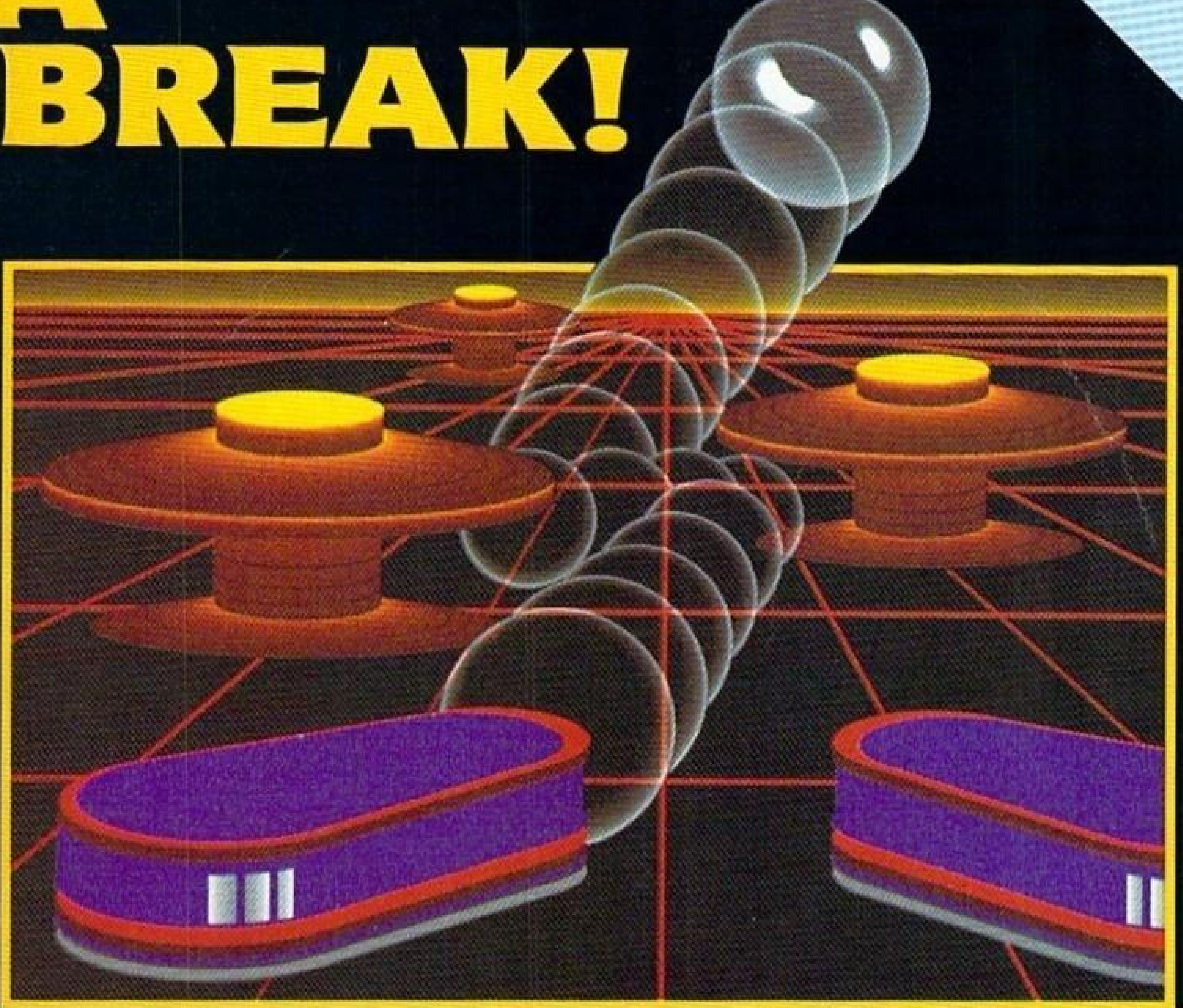
```
330 N(J)=N(J)=M(J): If
    M(J) Then M=M+1:
    N=N+1
```

C

Donald G. Barker
College Station, Texas

For
Commodore 64

TAKE A BREAK!



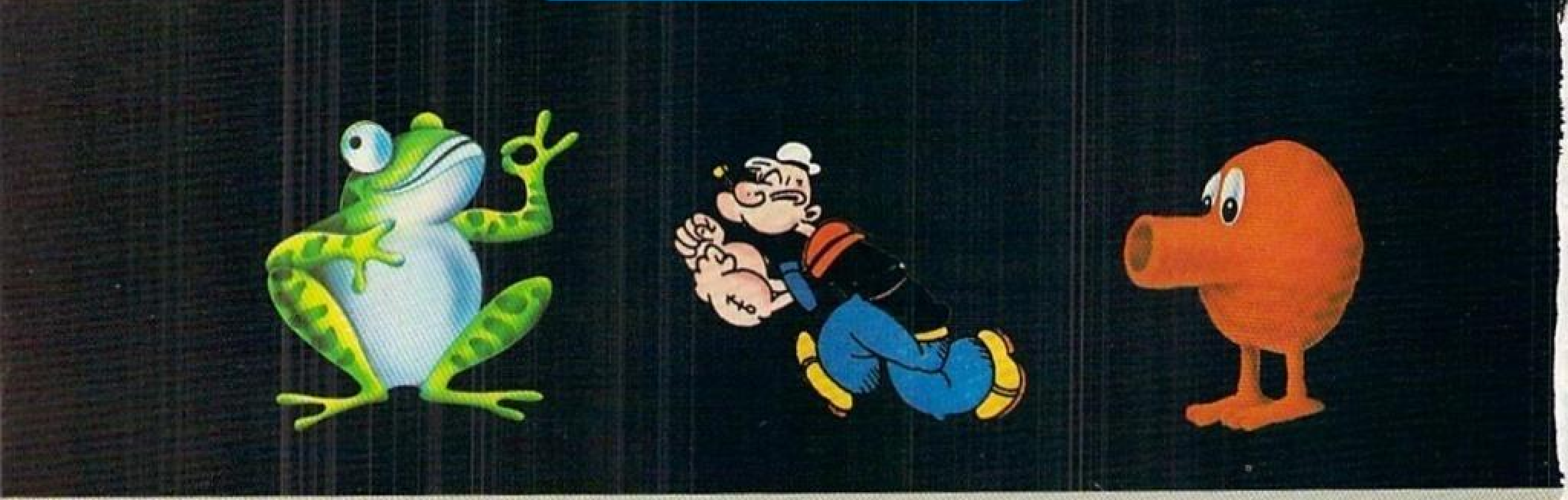
WITH NIGHT MISSION

PINBALL

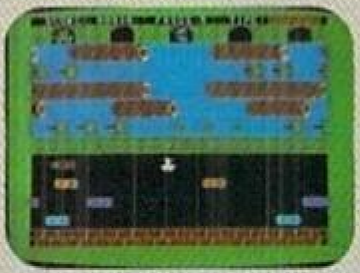
You deserve the best. You've earned it. Now reward yourself with a session of **Night Mission PINBALL**, the most realistic and challenging arcade simulation ever conceived! ■ Stunning graphics and dazzling sound effects put **Night Mission PINBALL** in a class by itself. Game features: multi-ball and multi-player capabilities, ten different professionally designed levels of play, and an editor that lets you create *your own* custom modes. ■ So take a break with **Night Mission PINBALL** from SubLOGIC. Winner of *Electronic Games* magazine's 1983 Arcade Award for Best Computer Audio/Visual Effects.

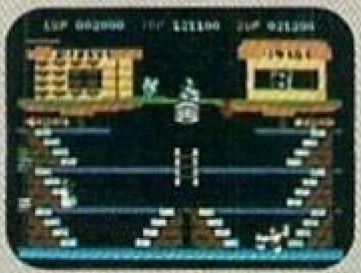
See your dealer . . .

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820 USA
(217) 359-8482 Telex: 206995



GIVE YOUR COMMODORE 64™ A LITTLE CHARACTER.





PLAYER 1
PLAYER 2

Your Commodore 64 is a great computer system. And one of the things that's great about it is it can play three of the greatest Arcade Action games ever. Frogger,*™ Popeye,® and Q*bert,™ from Parker Brothers.

The award-winning FROGGER is one of the top selling Arcade Action games of all time. With graphics that are nothing less than ribbitting and game play that gets tougher as you get better.

And POPEYE has you running through three screens of non-stop action, where you try to capture Olive Oyl's heart while avoiding untold dangers, including Brutus and the Sea Hag.

As for Q*BERT, he's irresistible. Jumping from cube to cube, trying to avoid an army of nasty critters, he's jumped into the hearts and minds of millions.

Frogger, Popeye, and Q*bert, from Parker Brothers' Arcade Action Series. They make your Commodore 64 computer feel as close to the arcade as you can get.

PARKER BROTHERS

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We're Going Bi-Monthly

Since the Consumer Electronics Show gets plenty of coverage in this issue in our new "News From the Front" department, I don't need to say much more about it. So let's talk about the other big news, instead—like the fact that *Power/Play* is going to be bi-monthly as of our next issue. And not only are we going to be bi-monthly, but we're changing our format so you'll like us better than ever before.

What does that mean, exactly? Well, on our former quarterly schedule, you wouldn't have received your next *Power/Play* until mid-July. But on our new bi-monthly schedule you'll get your next issue in May, instead. Then you'll get the next one in July, and so forth until you get the same number of issues you paid for. What this means for our subscribers is that your subscription will run out earlier in the year. But don't worry about missing any issues. We'll let you know in plenty of time when it's time to renew.

The new format will, first and foremost, have *pizazz.* We're going to stop looking like *Commodore* magazine's baby sister and go for an identity that's distinctively our own. Not only that, but we'll be bringing you more of the editorial content you want. We've already taken one step in that direction with our "News from the Front" department in this issue. From now on you can look there to find out what's really going on throughout the home computer industry.

In addition we'll be starting a new section devoted strictly to games—and not just Commodore's in-house games but independent games, as well. We've lined up a team of super reviewers who know games inside-out, to make sure you get the accurate, in-depth reviews you want. We'll be providing strategy tips from experienced gamers so you can score higher in your favorite games. And we'll continue to give you game programs you can type and save—and programming techniques to help you create your own games—all in our new "Games and Recreation" section.

As always, we'll continue to provide programming instruction from notables like Jim Butterfield and Mike Tomczyk, and will keep running our Commodore Challenge Contest so you can get a chance to have your original programs judged by our panel of experts. We'll also maintain our popular Kids' Corner—by, for and about Commodore kids—and keep you up on the latest in learning at home with David Malmberg's regular No More Pencils... column. In other words, we'll be doing some rearranging and adding—but we'll be keeping the best of what *Power/Play* has had to offer all along.

If you've been wondering about Commodore's new computers, you can find out about them in "News from the Front". The 264/364 series machines stirred up a great deal of interest at the Winter Consumer Electronics Show, and also raised a lot of questions that we'll be trying to answer for you in both *Power/Play* and *Commodore* magazines. See you in May. **C**

—Diane LeBold, Editor

Commodore's New 264/364 Computers Headline Winter CES

COMMODORE 64 SOFTWARE FAVORED AMONG INDEPENDENT SOFTWARE COMPANIES

THE big news in computers at the January Consumer Electronics Show (CES) was, of course, the new 264/364 computers from Commodore. No other computer company had anything nearly as exciting—unless you consider the somewhat overrated PCjr. to be exciting.

In addition to its new computers Commodore also introduced a number of important new software packages for both the 264/364 and the Commodore 64. And independent software companies showed up with an astounding array of software for the Commodore 64, as well.

THE NEW COMMODORE 264/364 SERIES COMPUTERS

BOTH the 264 and the 364 use a 7501 microprocessor and feature 64K RAM—*60K available for programming*—full color, a built-in machine language monitor and extended BASIC (BASIC 3.5). BASIC 3.5 offers 50 additional commands on top of standard PET BASIC, most of them for sound and graphics. You might say it's like having a Super Expander built in.

Both computers also have the option for built-in software. Right now it looks like users will have a choice of word processing, LOGO or a general business package if they want to exercise this option.

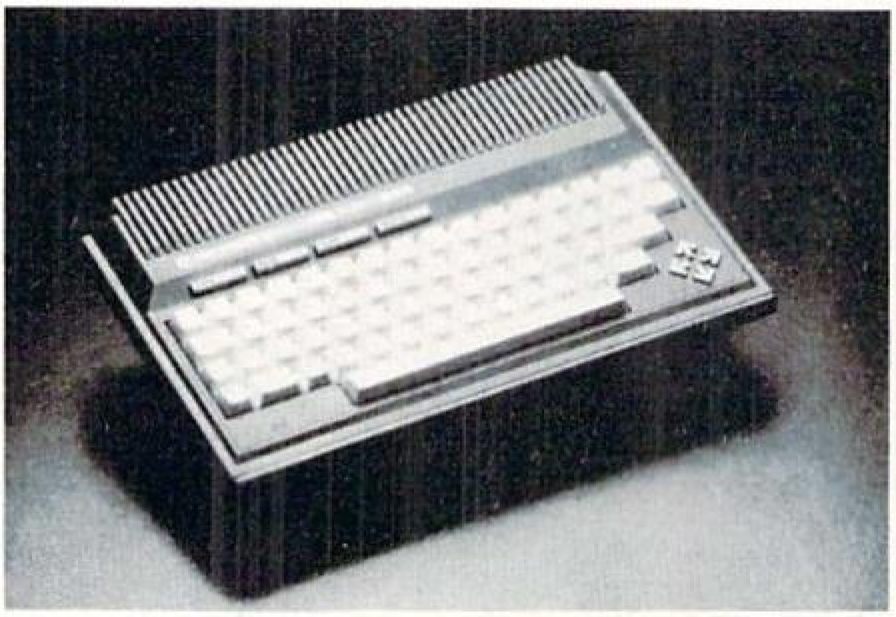
The 264/364's have 40-column screen displays with 320 by 200-pixel resolution. With their 16 colors and eight luminence levels, they offer a range of 128 possible color variations. They also have a screen window capability that makes graphics/text combinations easier to create than ever before. Other features include two tone generators (voices) with eight volume levels.

The keyboard on the new computers is all you might expect and more. In addition to the full-size typewriter keyboard you're used to, you get four separate cursor control keys, four programmable function keys, color control keys and a HELP key. And you get ports galore—a user port for modems and such (a new 264 modem will be offered, by the way), serial port, cartridge port, two joystick ports and cassette interface port.

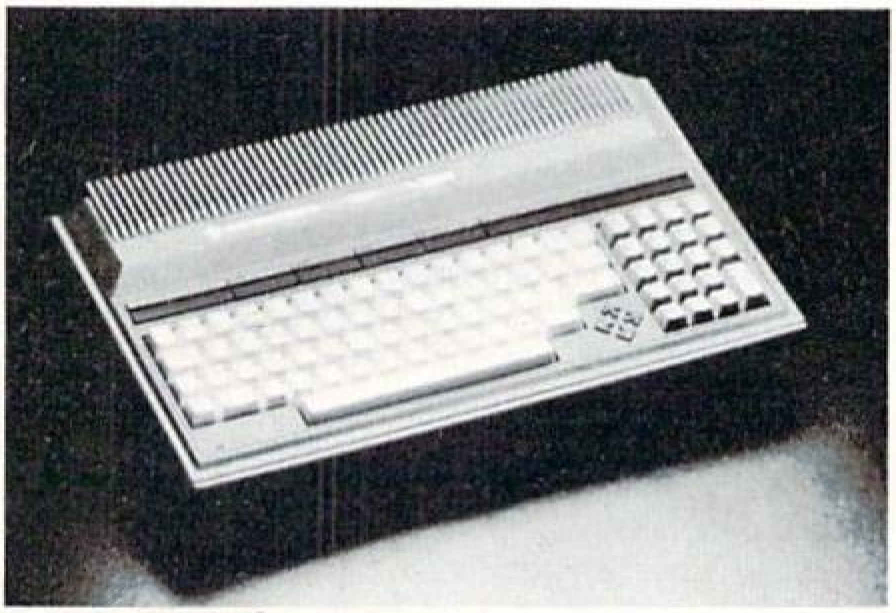
The computers will run Commodore's existing 1541 disk drives, 1526 printers, 1520 printer/plotters and 1702 color monitors. But they will also be compatible with a new series of peripherals, including Commodore's new SFS 481 fast disk drive, the new Commodore MCS 801 color dot matrix printer, MPS 802 black dot matrix printer and 1703 color monitor. They are not, however, software-compatible with other Commodore computers.

What's the difference between the 264 and 364 computers, then? Only this. The 364, in addition to having all the features of the 264, also has a separate numeric keypad like the big boys and—are you ready?—a built-in voice synthesizer. How does that sound?

Although it wasn't demonstrated at CES (it was there, but just not demonstrated), you should also know that a low-end member of the 264/364 family is in the works, as well. Known right



The Commodore 264 has 60K RAM available for programming.



The Commodore 364 has all the features of the 264 plus a numeric keypad and built-in voice synthesizer.

now as the Commodore 116, it's a 16K version that, rumor has it, will sell for less than the VIC 20. You'll be hearing more about that one later, as soon as details are available.

COMMODORE SHOWS NEW SOFTWARE

IN ADDITION to stealing the show with the new computers, Commodore also wow-ed CES visitors with some outstanding in-house software for both the 264/364 series and the Commodore 64.

Foremost among the business packages being shown at the Commodore booth was *3-Plus-1* for the 264/364 and Commodore 64—a combination word processing/spreadsheet/data base/graphics package. Other business packages included *The Manager* (a data base for the Commodore 64), *Magic Desk II* and *EasyCalc* for the 264/364 and 64, *Superscript* (a word processor for the 264 that is also available for the B128 business computers), *B/Graph* (business graphics), *Financial Advisor* and *Teligraphics*™ videotext and graphics software.

In education, Commodore has some software that makes you wish you were back in school again (if you aren't already in school, that is). For instance, we finally got to see the incredible *Home Planetarium* developed by Dr. Frank Covitz for Commodore. To use this program for the Commodore 64 you enter longitude, latitude, date and time of day for any place on earth—and, voila! you get the sky just as it would look. Major constellations within your immediate range of vision are labeled. If you want to locate a star, planet or constellation, type it in and the program pans the sky. Watch the stars roll by in real time—speed them up or slow them down—or use any one of many other options.

Want to know more? You'll have to wait for our in-depth review. The *Home Planetarium* is a very thorough astronomy package that deserves some detailed attention.

Among the other extraordinary educational packages shown at the Commodore booth at CES was *Imagine*, a graphics/creative writing tool for the Commodore 64. They say this program was designed for kids aged seven to ten, but it seems like almost anybody could have a great time with it.

To use *Imagine* you first select one of nine possible screens—say, for instance, an underwater scene. Then you add items to the picture from among a group of possibilities that appears in the upper right part of the screen—for instance, you might want to add a diver and a giant clam to the underwater scene. Then, using a joystick, you plot a path of movement for any of the items you added to the scene—you might want to make the diver swim across the screen, for example. And finally you use the program's word processing capabilities to write a story about the picture you've created. It's as much fun as it sounds.

Other educational products introduced by Commodore at the show included the *Commodore Kid* series, which allows children to move at their own pace in order to learn various subjects; the Milliken *EduFun!* series for the VIC 20 and Commodore 64; the *Kinder Koncepts* series for the 64, *Chopper Math* and *Type Right*.

Commodore's *Micro Cookbook* was one of the outstanding home applications programs being shown at CES for the Commodore 64. We reviewed it in the last issue of *Power/Play*, but it's worth bringing up again, since its capabilities just as a data base—whether you want to store recipes or book reviews—are pretty exciting. If you don't see this one on your dealer's shelves in a short time, tell him to ORDER IT!

As far as games go, we won't mention that our own Steve Finkel was at CES demonstrating *International Soccer* for the Commodore 64. He'd be embarassed if his readers knew he spent four days in soccer shorts, challenging show goers to beat him at his favorite game. (So far he remains the all-time *International Soccer* champ.) We will mention, however, that Commodore's Judy Braddick was there showing off her conversion of the arcade hit *Solar Fox*, soon to be available for the Commodore 64. And for those Commodore 64 owners who have been looking for a chess program—hallelujah!—we've finally got one and it looks good.

INDEPENDENT SOFTWARE COMPANIES FAVOR THE 64

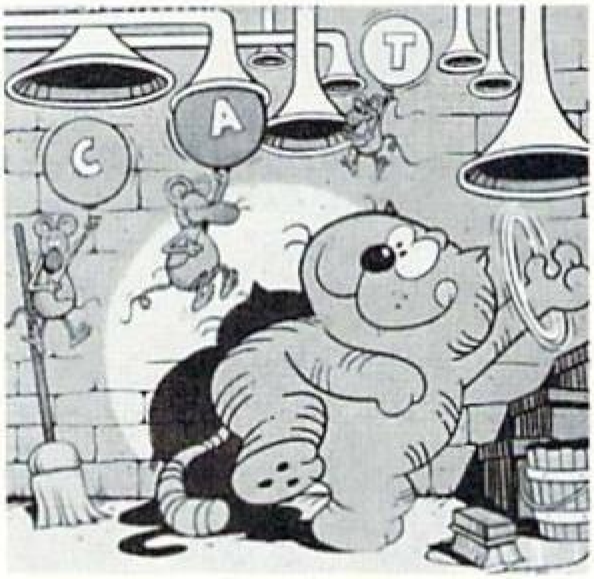
IF THERE were any independent software companies at the CES who were NOT showing programs for the 64, they were well hidden. What an incredible selection, from heavy duty business packages to flight simulators to aerobics programs to reading tutors for tots.

First and foremost, of course, were the games . . . and games . . . and more games. Conversions by Parker Brothers of the old stand-bys *Frogger* and *Q-bert*, *Minnesota Fats' Pool Challenge* from HES (you even got to meet Fats himself, who was playing pool at the booth—he's not fat at all, by the way), and all that slick stuff from Electronic Arts, like *Pinball Construction Set* and *M.U.L.E.*, were there.

From Epyx there was a great baseball action/strategy game called, modestly, *The World's Greatest Baseball Game* and a really nutso puzzle game called *Puzzlemania*, developed by Ken Uston. The intriguing thing about *Puzzlemania* is not just that you have to work out the puzzles, but that you first have to figure out what the rules of each of the 49 different puzzles ARE. You've got to pay extremely close attention. In addition to these two, Epyx also showed a timely Olympic sports game called *Summer Games* that looked pretty good.

Among the other games shown by independents were *Pro Golf* from HomeComputer Software, an action/strategy game that kept my interest even though I'm bored by real golf, and a selection of distinctive games from Tymac for both the Commodore 64 and VIC 20. Tymac has a secret recipe for creating VIC graphics so they look almost like 64 high-res and has managed to program voice into their Commodore 64 games using only software. (*Pegasus and the Trials of Perseus* was one of the prettier "Tymac Talkies" for the 64.)

Many game companies, it seems, are now licensing well known characters from TV or the comics, and creating



Comic strip cat Heathcliff is among the characters licensed by independent software companies for use in Commodore 64 software.

http://www.oldgamesitalia.net/ http://www.oldgamesitalia.net/

games or educational programs (for better or worse) around them. Datasoft, for instance, is using Heathcliff (the comic strip cat), Gumby (a few old timers might remember the friendly flathead from Sunday TV), Bruce Lee and the TV series *Dallas*. Among these, Datasoft's most interesting was their graphic adventure *Dallas Quest*, based, of course, on the series.

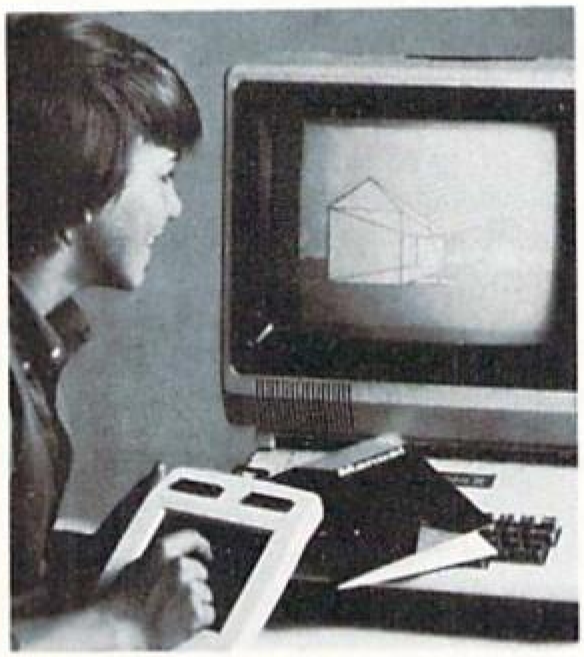
Also jumping onto the character-licensing bandwagon are Sierra On-line (with *B.C.'s Quest for Tires, Wizard of Id* touch typing, and *The Prisoner,* based on the now-defunct TV series), CBS (with Sesame Street and Mr. Rogers Neighborhood educational-type programs) and Epyx (with an action game based on the science fiction book series, *Dragonriders of Pern)*. All of these, of course, for the 64.

One of the more exciting character-licensing agreements, announced with some fanfare at CES, is the newly formed alliance between Adventure International (our old buddy Scott Adams) and Marvel Comics. The result will be some Marvel adventures (Spider Man, The Hulk, etc.) coming out of Adventure International in Florida—hopefully for the Commodore 64, as well as other popular computers.

DON'T GO AWAY, WE'RE NOT FINISHED YET

YOU want to talk about graphics packages for the 64? Okay. Let's talk then about the *Moviemaker* that was shown at CES by Reston Software. This package, developed by a New York-based company called Interactive Picture Systems (IPS), is an extraordinary product that wasn't getting nearly the attention that it should have. It lets you easily develop your own settings and characters and move things around on the screen to create short animated cartoons—with absolutely no programming experience. In addition to being a unique toy in and of itself, the *Moviemaker* can also be used as a software development tool in the creation of games or any other programs requiring exciting graphics.

Other graphics packages worth talking about are the KoalaPad™, a lightweight, easy-to-use touch pad for the 64 developed by Koala Technologies and the Gibson Light Pen, also from Koala Technologies. Everybody at Commodore loves the KoalaPad and we hear the Gibson Light Pen is supposed to be pretty good, too, although we haven't seen it in action, yet. For more information on the KoalaPad see Issue 28 of *Commodore* magazine and Betsy Byrne's article in Kids' Corner this month.

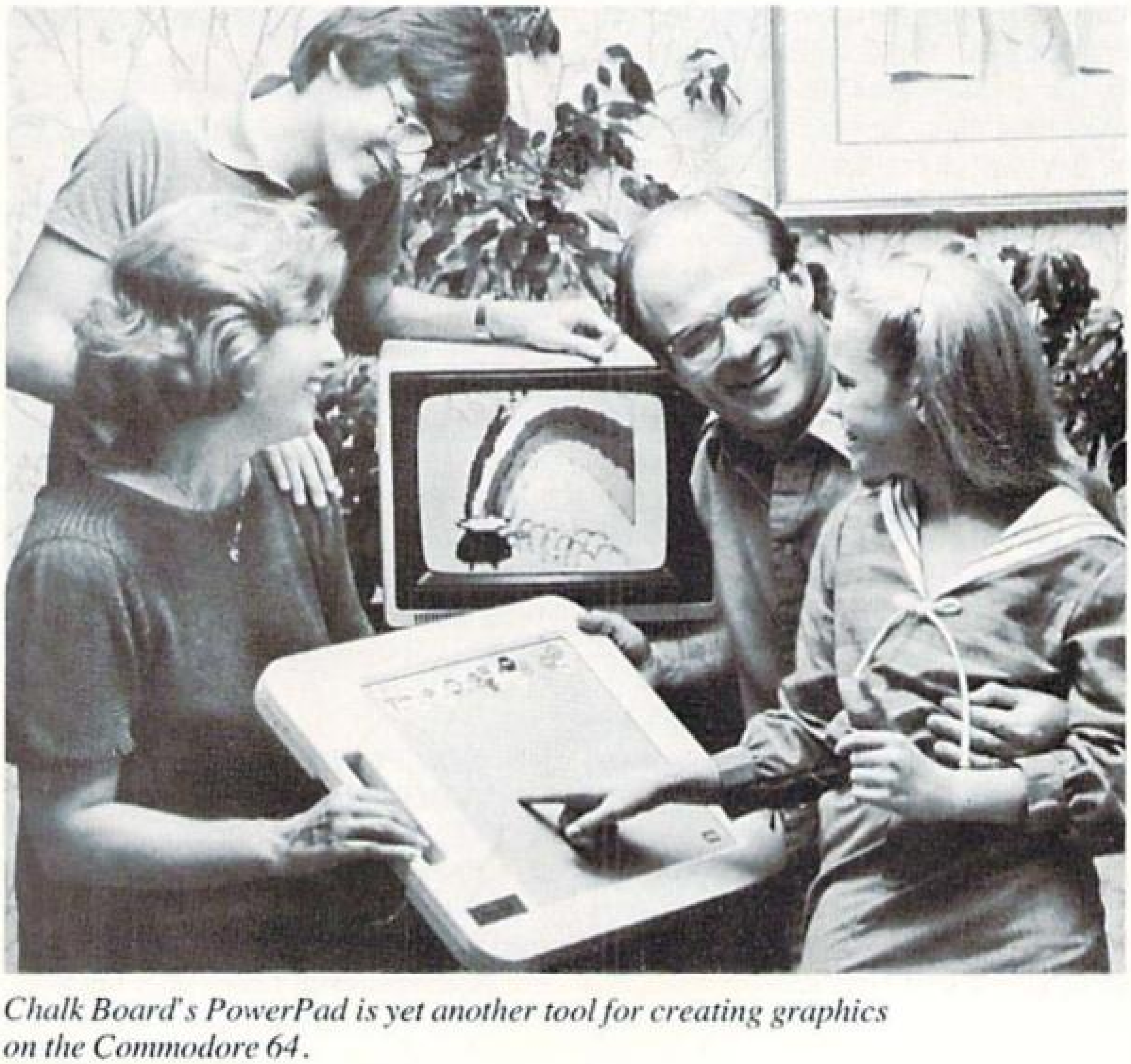


The KoalaPad touch tablet lets you create exciting graphics on the 64 with no programming experience.

Just to be thorough, we should mention that other graphics packages for the Commodore 64 being shown at CES included *Sketch and Paint* from Comm*Data, *Delta Drawing* from Spinnaker, *Paint Magic* from Datamost, *Paint Brush* from HES and a touch pad, called *PowerPad*, from Chalk Board.

Then we have music for the 64, of course. We'll be talking in detail about Electronic Arts' *Music Construction Set* in a later issue. Other music packages being talked about at the show included *Dancing Feats* from Softsync, *Synthesound 64* from HES and a very versatile synthesizer package for the VIC 20, *Music Synthesizer,* available from Broderbund.

A lot of educational software is inclined to look alike, but at this year's CES a few packages from independent developers really stood out. The *Story Teller* series from Comm*Data offers, for instance, a unique approach to teaching young children to read, using the Commodore 64. A figure on the

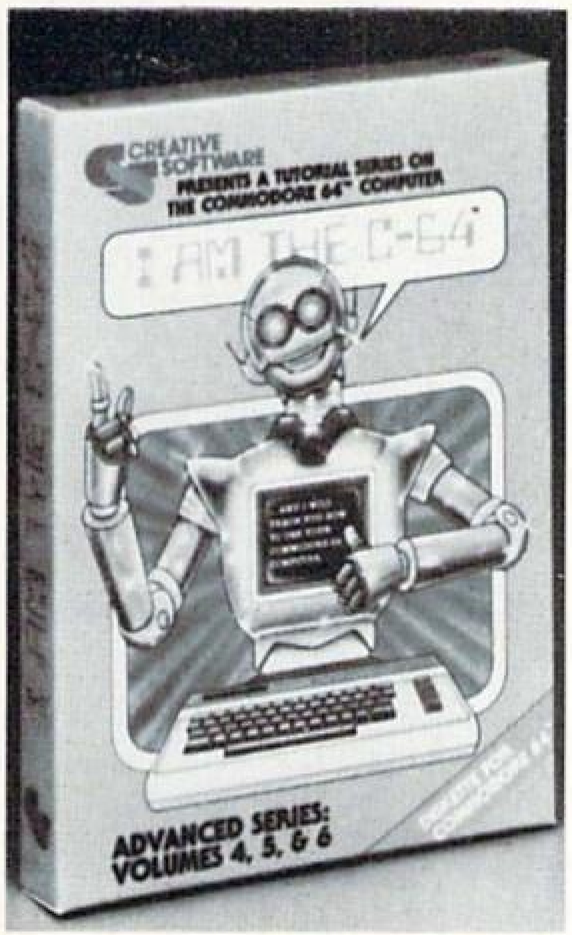


Chalk Board's PowerPad is yet another tool for creating graphics on the Commodore 64.

screen slowly speaks the words (a story) that are written at the bottom of the screen. As the figure (or creature, or whatever it happens to be) speaks each word, that word lights up. Even more interesting, the speech is done entirely with software and is actually understandable.

In addition, independent software companies were showing creative writing packages similar to Commodore's *Imagine*—that is, children can create pictures on the 64, then write a story to go with the pictures. Among those shown at CES were Spinnaker's *Story Machine* and Sierra On-Line's *Storymaker.*

Then we have all the learn-to packages—learn to type, learn to program (for instance, *I am the C-64* from Creative Software), learn to stay healthy. The health-oriented programs looked interesting, at least on the surface. The *Model Diet* from Softsync, for instance, was written by the founder of the company, who also happens to have been a high-fashion model. The *Aerobics* program from Spinnaker was created using the IPS graphics package we talked about at the beginning of this section, and looked pretty good, also—except that the figure on the screen did very weird things with her knees that I hope wouldn't be expected from a three-dimensional human being. *Total Health* from Computer Software Associates we didn't actually see. The one that looked most interesting, however—at least from an editor's stress-syndrome perspective—was *Relax* from Synapse, a company that generally has excellent stuff.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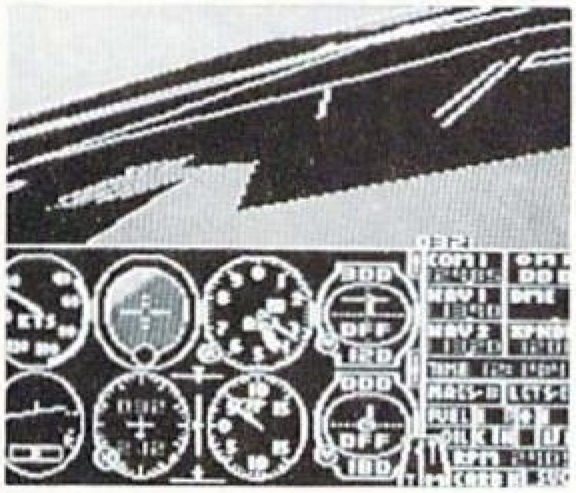
Teach-yourself-programming packages for the 64 are available in abundance from independent developers as well as Commodore itself.

SubLogic's *Flight Simulator II* looked very realistic, although it hadn't yet been released for the 64 at the time. We should have a copy for review by the time you read this. Business software for the 64 was everywhere in great abundance—including some very serious looking packages from Southern Solutions (who, for those old timers in the crowd, are also evidently marketing some of the old Dr. Daley's software, now). A *Computer Mechanic* program from Softsync that Betsy Byrne swears by, Art Linkletter's *Kids Say the Darnedest Things* software from HomeComputer Software and an array of products we didn't even get to see—all for the Commodore 64 from independent developers. Even the most adamant Commodore competitor (whoever that may be, these days...) would have to admit that the 64 is inspiring software developers to new heights. ☐

—*DIANE LE BOLD*



SubLogic's Flight Simulator II *creates a real sense of flying a small plane.*

Epyx Introduces *Robots of Dawn*, Computer Strategy Game

Michael Katz, president and chief executive officer of Epyx, announced that Epyx has licensed the rights to the best selling science fiction *Robot* series by world-renowned author Isaac Asimov. The first home computer game, *Robots of Dawn*, is based on Asimov's most recent novel which is currently on all the best-seller lists.

The fascinating epic murder mystery requires the player to piece together the elusive clues to solve the eternal question. "Who done it?". The player becomes Earth's most famous future detective, Elijah Baley—questioning the inhabitants of far-flung cultures to determine who's lying, who's telling the truth and who is trying to murder him.

Katz said, "We are delighted to have obtained the *Robot* license from Doubleday and look forward to a whole series of games based on Isaac Asimov's successful science fiction book series."

Robots of Dawn for the Commodore 64 has a scheduled release date of June/July, 1984.

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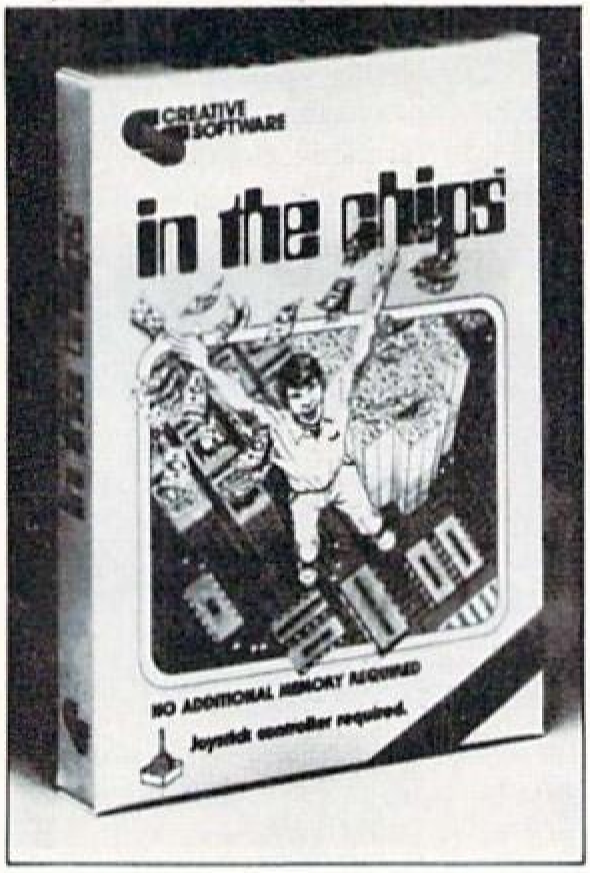
Creative Software Starts Year With New Commodore 64 Titles

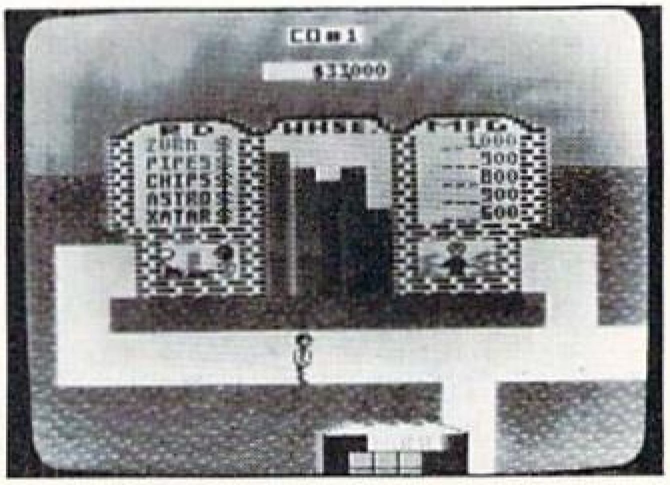
Creative Software has added three new titles to its software line for the Commodore 64. The titles include *Crisis Mountain,* a game licensed from Synergistic Software, and two educational programs, *In The Chips* and *I Am The C-64*.

Crisis Mountain is an action game that challenges the player's strategic skills. The player controls "Kip" Armstrong, a daring mine explorer who has stumbled onto hidden mountain treasures as well as traps, bombs, and blood-sucking bats. As he winds his way through dark caverns, two buried time bombs tick away in remote caves and threaten to destroy the mountain . . . and Kip.

Kip must reach the bombs, dig them up and deactivate them. After he has destroyed both bombs, he is free to collect point-earning treasure and progress to an even more dangerous and treasure filled mountain.



I Am The C-64 is a video tutorial that takes the new computer user step-by-step through the capabilities and functions of the Commodore 64. It is a colorful program that enables the user to learn quickly in an enjoyable "hands-on" format.



In the Chips *from Creative Software is now available for the Commodore 64*.

In The Chips and *Crisis Mountain* are scheduled to ship at the end of January. Both programs are in cartridge form and retail for $34.95. Part I and Part II of *I Am The C-64* are presently available in disk form for $34.95 each.

Commodore Expands Into Book Business

Commodore is expanding into the computer book business, referring to it as "bookware."

According to Sig Hartmann, president of Commodore Software, "Commodore is committed to becoming a major force in the publishing business. This includes not only computer books but also book and software sets and computer magazines."

In a related story, Michael Tomczyk, director of market development and publications announced that Commodore sold more than 600,000 programmer's reference guides in 1983. Says Tomczyk, "Every new computer introduced by Commodore will have a programmer's reference guide. We're now working on the programmer's reference guide for our new Commodore 264, which goes on sale in the late spring."

New Commodore bookware includes the "VIC 20 4-Book Pack", four books in a boxed set, provided by Commodore in conjunction with Hayden Book Company. The four books included are *The VIC Revealed, VIC Graphics, VIC Games* and *Stimulating Simulations for the VIC*.

Another new bookware product is a book-and-software set called *Mastering Your VIC 20*. This book includes eight BASIC programs on tape and a 191-page paperback book.

Commodore is also developing a new series of products called the *Programmer's Treasure Chest* series. The new products will include books, software and reference materials such as posters and reference cards. *Programmers Treasure Chest I,* the first in the series, will be available in the early spring.

Commodore Leads In Telecomputing

Commodore sold over 100,000 modems during 1983, making it one of the world leaders in modem units sold.

The large number of modem-equipped home computers has dramatically increased the use of telecommunications information services such as CompuServe. This increased interest has allowed Commodore and CompuServe to continue and expand the Commodore Information Network, a special service exclusively for Commodore computer owners.

The Commodore Information Network (CIN) is a combination of almost 1000 pages of technical tips, dealer and user group listings and technical tips. In addition, there are bulletin boards and special interest groups (SIGS) within the CIN.

During the last 18 months, this network has become the most active network on CompuServe.

Chalk Board Introduces New Home Computer Learning System

Chalk Board, Inc., announced the introduction of a revolutionary learning/entertainment system for the home computer market. The system consists of two technologically advanced products, designed, produced and marketed by the Atlanta based company: The PowerPad computer touch-sensitive input device and *Leonardo's Library* of innovative software for use with the PowerPad.

The Chalk Board PowerPad is a 120 x 120 touch-sensitive tablet, housed in a 200 x 170 hard plastic case. The PowerPad effectively replaces the computer keyboard and is regarded as a breakthrough in computer ease of use. PowerPad utilizes multiple-point contact (vs. other devices' single point) which responds to direct hand contact with the surface. A series of mylar keyboard overlays, when used with accompanying cartridge or diskette software, provides a range of applications. These include an artist's canvas, a piano keyboard, a game board, a LOGO-language package and a programming kit to create new software using the PowerPad.

Leonardo's Library is a series of specially designed software in six subject areas: music, mathematics, visual arts, science, language arts and social studies applications. The *Library*, which initially consists of eight packages and eventually will total more than 30, provides an integrated and comprehensive system of learning subjects at various levels of sophistication.

PowerPad and *Leonardo's Library* run on both the Commodore 64 and the VIC 20. PowerPad has a suggested retail price of $99.95; the software packages in *Leonardo's Library* range in price from $24.95 to $49.95. The products are currently available wherever home computers are sold.

Four New Titles for Commodore 64 Announced by Computer Software Associates

INTRODUCING 64 DOCTOR, *A DIAGNOSTIC PROGRAM FOR THE COMMODORE 64*

This disk- or tape-based program for the Commodore 64 from Computer Software Associates allows a "down" user to diagnose hardware malfunctions throughout their system in a matter of minutes. The quick-loading program checks out keyboard, audio, video, joysticks, RS-232 port, disk drive, printer, RAM memory, and cassette player.

Available on tape for a suggested retail of $24.95 and on disk for $29.95, *64 Doctor* is part of CSA's Utility Series.

TOTAL HEALTH *PROVIDES NUTRITIONIST GUIDANCE TO COMMODORE USERS*

Computer Software Associates also has a solution for computer users who want to make sure that micros aren't hazardous to their health. Their new program, *Total Health*, for the Commodore 64 and VIC 20 provides a sensible guide to diet and exercise.

So if fat is not where it's at, or being too lean makes you mean, consider *Total Health*. The program requires no expansion and is available for under $30, so you can still eat well.

64K PAK *OFFERS TEN EDUCATIONAL PROGRAMS FOR COMMODORE 64*

64 Pak, a new program for the Commodore 64 from Computer Software Associates, gives family or school users ten easy-to-use learning programs. Especially designed for the novice, the non-threatening, menu-driven *64 Pak* is an excellent way to begin learning and interacting with a home computer. Simple on-screen instructions allow users to enjoy the program at once, without the need to read complex documentation.

The ten programs included in *64 Pak* are: *Flash Cards, Speed Read, Sign Talk, Life Expectancy, World Clock, States and Capitals, Mortgage Calculator, Big Time, Cash Register,* and *Perpetual Calendar*.

EDUCATIONAL PROGRAMS FOR THE VIC 20

The Massachusetts-based publisher of home, business, entertainment and utility programs, is also offering an initial line of courseware designed for preschoolers and school-age children. A number of programs, all on cassette tape for the Commodore VIC 20—and not requiring any memory expansion—comprise CSA's educational curriculum. Programs include *Math Duel, Tiny Tutor, VIC Sketch, Composer* and *Sprintyper*.

All the cassettes work on an unexpanded VIC 20. *Math Duel, Tiny Tutor* and *Sprintyper* carry a suggested list price of $19.95; *VIC Sketch* and *Composer,* $14.95.

Total Health

Plan a sensible diet with Total Health *from CSA.*

news from the front

QuickFix™ Debugger for Assembly Programmers Introduced by Quick Brown Fox

QuickFix, a one-step debugger designed to help users of Commodore, Atari and Apple computers write in 6502 assembly language more quickly and easily, was introduced by Quick Brown Fox at the Winter CES.

The new software allows a programmer to specify and display the contents of all the registers of the 6502 as well as the contents of memory locations that the program uses. Heretofore, debugging had been a tedious and time-consuming operation due to the difficulties involved in observing each register and memory location.

Among the commands in *QuickFix* are: execute the next instruction; set program counter, accumulator, and X and Y registers; single-step the next subroutine call; display, store or erase blocks of memory; and store the value x,y... in the memories starting with location a.

QuickFix is available for the Commodore 64, Atari 400 and 800 disk versions, and the Apple II and IIe microcomputers. It carries a suggested retail price of $39.95 and is slated for February delivery.

Commodore, CompuServe Sign Agreement Offering VIDTEX

Commodore recently announced that it has signed an agreement for CompuServe's VIDTEX terminal emulator, a popular telecommunications program. The agreement allows Commodore to sell, market and distribute VIDTEX worldwide. In addition, CompuServe will continue to market the package direct and through its dealer network.

Commodore's two staff telecommunications experts, Barb Karpinski, telecommunications editor and wizard SYSOP on the Commodore Information Network (CIN) and Tony Caramanico, the workhorse behind the CIN, have nothing but praise for VIDTEX. They have used the 64 version of the program for almost four months now and the CBM 8032 version for over a year. When I asked Barb for her comments she replied, "This is great! It's the best thing we could have done." Tony feels that VIDTEX is "one of the most versatile telecommunications packages available due to its full uploading and downloading capabilities."

The VIDTEX package uses CompuServe's "B" Protocol with 100% error detection for image files, ensuring that programs upload and download errorless. VIDTEX will even detect if the program to be downloaded was written for another computer.

VIDTEX is currently a disk-based program with versions for the Commodore 64 and the PET/CBM computers.

—*JIM GRACELY*

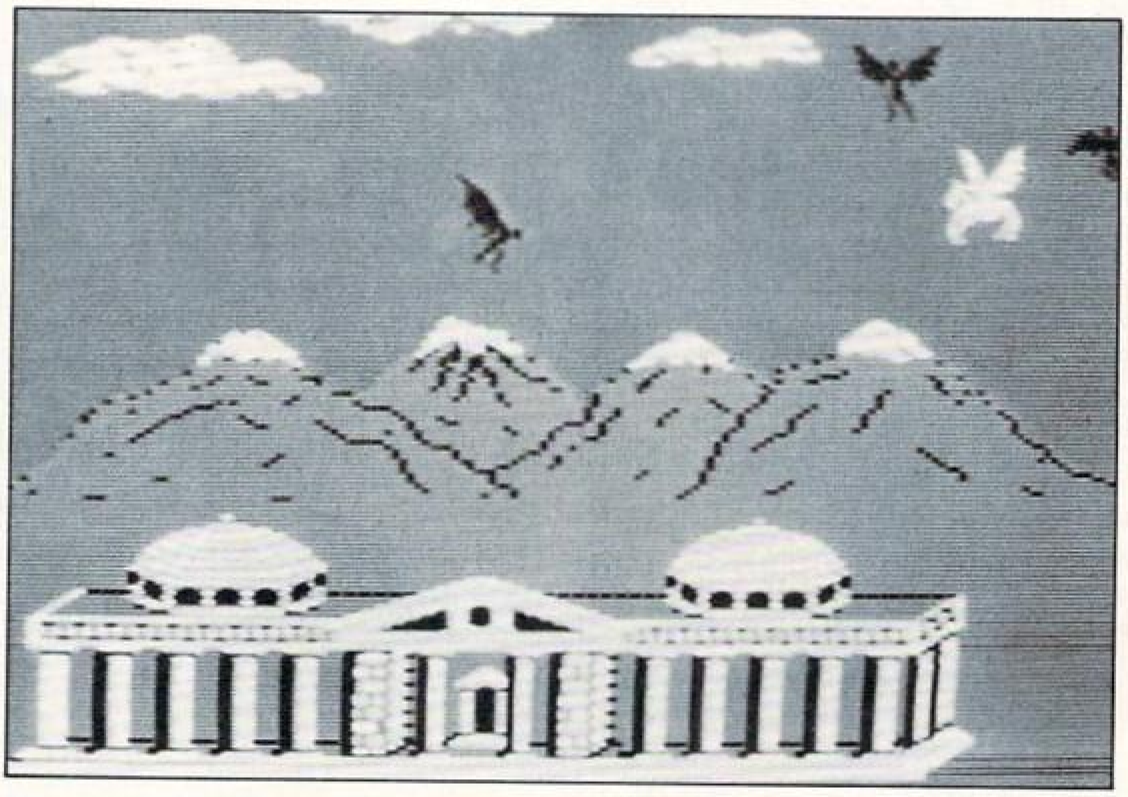
Tymac Introduces Four New "Talking" Games for the Commodore 64 and VIC 20

The "Tymac Talkies", exciting new action and adventure games on diskette and cassette for the Commodore 64 were introduced by Tymac at CES.

The games, *Flyer Fox, Gandalf the Sorcerer, Pegasus and the Trials of Perseus,* and *First Strike*, are one-player 3D-simulation games designed by Game Gems, Inc. exclusively for Tymac. They bring the Commodore 64 to life with words, music, arcade sounds and sound effects previously unavailable without a costly synthesizer. The Tymac Talkies also provide high-resolution arcade-style graphics and color, creating a new dimension of home computer game-playing excitement.

Two new talking games for the VIC 20, *Samurai* and *Codename: DEADZONE*, are available for the VIC 20, as well as an educational/fun program, *Type-Snyper. Wizard Graphics*, a VIC 20 utility program was also introduced at CES by Tymac.

Tymac's new *Samurai, Codename: DEADZONE, Type-Snyper* and *Wizard's Graphics* are available on cartridge for $34.95.



Pegasus and the Trials of Perseus, *a talking game for the Commodore 64 from Tymac.*

Softsync's *Dancing Feats* Makes Players Instant Musicians

First, there was Mozart on harpsichord. Then, there was Elvis on guitar.

Now, thanks to Softsync, you can play music on your computer and create radiant bursts of color on your screen.

The New York-based software company has recently released *Dancing Feats,* a software program which allows the user to play music instantly.

Designed by ex-Atari programmer Christopher Chance, the program is also billed as "The One Man Joystick Band."

"Do you want to play the blues? Rock 'n roll? Jazz?" asks Ken Currier, Vice President of Programming at Softsync. "Just plug in your joystick and you can play like an experienced musician."

"The program will even allow you to record and save your compositions," adds Currier. "Play back your piece, and you're a musician with a recently released single."

A series of menus allows users to choose the bass, beat, style, tempos and ending they desire. Currier likens these selections to a "back-up group."

"The user then plays with the joystick, moving it about rhythmically to choose a melody," Currier explans, adding, "What's great about *Dancing Feats* is its ability to stimulate and then develop the musical and rhythmic senses in both kids and adults."

"As you play, the notes and chords are displayed on the screen," says Currier, "which helps you learn to relate the sounds to the notes."

The program is presently available on the Commodore 64 and Atari computers.

Broderbund Software Announces New Titles for Commodore 64

Broderbund Software announced that eight titles from among their line of popular software are now available for the Commodore 64. These include seven games and a word processor.

All the games are conversions of titles that have already proven successful among users of non-Commodore computers. These include *Seafox, Serpentine, Drol, Spare Change, The Mask of the Sun, Operation Whirlwind* and *Matchboxes*. All are on disk, with prices ranging from $24.95 to $39.95.

The word processor, *Bank Street Writer,* is also a conversion. It is also available on disk for a suggested retail price of $69.95.

American Educational Computer Software for Home Use

EASYREADER and MATCHMAKER programs are teacher-designed and have been carefully developed to follow established learning principles based on the traditional school curriculum. By paralleling the classroom experience, the software teaches lessons tailored to the child's needs.

All programs progress at the user's own pace, are easy to use and require no previous computer experience. Both series feature colorful, high resolution graphics and are educationally rewarding. The programs are available for Apple II, Atari 800, IBM PC, Commodore 64 and TRS-80 Color computers. Suggested retail selling price is $39.95 each.

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Using the Semicolon

by Michael S. Tomczyk

Michael Tomczyk

In English the semicolon may be used to tie two sentences together. In BASIC the semicolon is used to tie one BASIC command to the next immediate command (especially if the next command is on a different line). A common use is when you clear the screen.

Try this:

```
10 PRINT" SHIFT CLR/HOME"
   (Press RETURN)
20 PRINT"TITLE"
   (Press RETURN)
```

Type RUN and press RETURN. What happens? The word "Title" appears in the upper right corner of your screen... but it is one line down from the top! Whenever you CLEAR the screen, the next item you PRINT automatically appears on the second line from the top of the screen... unless you use a semicolon.

Now... add a semicolon to the end of Line 10, like this:

```
10 PRINT" SHIFT CLR/HOME";
   (Press RETURN)
```

Type the word LIST and press RETURN to see the new program, then type the word RUN and press RETURN. Presto! The word "Title" appears on the top line! Of course, the same technique works with a real title and that's one of the semicolon's programming uses.

You can eliminate the need for the semicolon and save yourself some programming space if you include the CLEAR SCREEN command in quotation marks along with the statement you're PRINTing, like this:

```
10 PRINT"SHIFT CLR/HOME  TITLE"
   (Press RETURN)
```

This automatically PRINTs the word TITLE on the first line because the CLEAR SCREEN command and word you want to PRINT are combined on the same line.

Printing Graphics Side-By-Side

Let's explore another use of the semicolon... this time with graphics. Type the word NEW and press RETURN. Now... we want to PRINT 22 hyphens across the screen to make an attractive border or dividing line between two parts of a program we're writing. There are two ways. One way is to type all 22 symbols in line 20, like this:

```
20 PRINT"----------------------"
```

Another way to do exactly the same thing is to use a FOR... NEXT loop, like this:

```
10 PRINT"SHIFT CLR/HOME";
20 FORX=1TO22:PRINT"-";:NEXT
```

Run this program and 22 hyphens appear on the top line of your screen. Note that line 20 is slightly shorter in the second program than in the first.

The semicolon tells the computer to PRINT each of the 22 hyphens in the FOR… NEXT loop right next to each other on the screen. Without the semicolon the hyphens would PRINT in a vertical column, each one on a separate line. Try removing the semicolon and RUN the program. Try substituting some of the VIC's other excellent graphic symbols instead of the hyphen.

Continuing Sentences

Using a BASIC program to PRINT a long instruction or sentence on the screen can be difficult because each program line is limited to four horizontal lines on your screen and sometimes the PRINT statements don't exactly fit together. Type NEW and RETURN, then enter this program:

```
10 PRINT"SHIFT CLR/HOME NOW IS
   THE TIME TO BUY A NEW
   COMMODORE DISK DRIVE AND PRINTER
   FOR YOUR COMM"          (RETURN)
20 PRINT"ODORE SYSTEM"
                           (RETURN)
```

RUN the program. Too bad—you had to continue your sentence on a second program line (line 20) but the lines don't match up! Try adding a semicolon at the end of line 10 like this:

```
10 PRINT"SHIFT CLR/HOME NOW IS
   THE TIME TO BUY A NEW
   COMMODORE DISK DRIVE AND PRIN
   TER FOR YOUR COMM";     (RETURN)
20 PRINT"ODORE SYSTEM"
                           (RETURN)
```

Now RUN the program and you'll see that the last part of the word "Commodore" is automatically attached to the beginning of the word because the semicolon ties together the two PRINT statements so they run together on the screen.

INPUTs Without Question Marks

Here's a really handy programming technique—using INPUT statements without those pesky question marks! Traditional INPUT statements have built-in question marks which typically appear on the next line after the "prompt" or question, as in this sample program:

```
10 PRINT"SHIFT CLR/HOME ENTER
   YOUR NAME":INPUTN$    (RETURN)
20 PRINT"SHIFT CLR/HOME YOUR NAME
   IS "N$               (RETURN)
```

In line 10 we CLEAR the screen, PRINT a prompt message then provide an input variable, which we call N$ (the variable we chose is arbitrary… it could just as easily be another "legal" string variable name like A$, XY$ or NN$). In line 20 we CLEAR the screen again and PRINT another message, this time using the name that was typed in. Here, N$, which is the name the user typed in, is PRINTed because N$ equals whatever the user typed in. A nice technique, right? But what if you don't want to use a question mark for the INPUT data? What if you want to have the user type in a list of items (like an inventory list, for example, or some business data)? Here's a very helpful technique you should experiment with and file for future reference:

```
10 OPEN 3,0
20 PRINT" SHIFT CLR/HOME NAME:"
   ;:INPUT#3,N$
30 PRINT" SHIFT CLR/HOME YOUR
   NAME IS "N$
40 CLOSE3
```

This is called inputting to the screen. Here's how it works:

Line 10: We "open" device number zero, which is the keyboard. The keyboard can be a device number just like a datassette, disk drive or printer (the datassette device number is 1, the single disk is device 8 and the printer is device 4). The keyboard is device zero. Opening the keyboard lets you PRINT directly to the screen while side-stepping some of the built-in functions like the automatic

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the VIC magician

question mark which appears when you usually program an INPUT statement.

Line 20: Here we CLEAR the screen again and PRINT a "prompt message" which is "NAME:"—then we provide for the INPUT of the name which we designate N$. INPUT#3 is the same as our usual INPUT statement except we are now inputting from the keyboard to the screen so we add the #3 as shown.

Line 30: The name that was typed in (N$) is included at the end of our simple PRINT statement (in quotes).

Line 40: Having finished inputting to the screen we want to get back to normal computer operation so we CLOSE3, which closes the device channel we previously opened in line 10.

Using the INPUT statement with colons instead of question marks is helpful, especially in financial calculation. Here's an arithmetic problem for you: let's say you work in the Commodore Software Division and you want to calculate the total cost of printing three different boxes at three different prices. You want to produce 50,000 *EasyScript* 64 wordprocessing packages in a box that costs $1.325, 100,000 *Magic Desk* cartridges in a box that costs $1.425 and 75,000 *Lazarian* game cartridges in a box that costs $.425 (these are *not* actual costs... and yes, fractions of pennies are used when calculating boxes... the answer is shown below). You could do this on a calculator but if you have the formulas set up in your computer you just have to enter the numbers and they'll be automatically multiplied. Enter and RUN this program:

```
 5 OPEN 3,0
10 FORX=1TO3
20 PRINT"SHIFT CLR/HOME ENTER
   COST:";:INPUT#3,A
30 PRINT
40 PRINT"QUANTITY:";:INPUT#3,B
50 PRINT
60 T=T+A*B
70 NEXT
80 PRINT"RESULT:"T:PRINT
90 CLOSE3
```

(Answer: $240,625) **C**

Converting VIC 20 BASIC Programs to the Commodore 64

by Jim Butterfield

Many BASIC programs will move directly from the VIC 20 to the Commodore 64 without the need for any conversion. BASIC is the same in the two machines, so there are only a few things that might need adjustment.

You may not need to allow for the differences in screen format: anything written for the VIC will use 22 columns and 23 rows and that will fit neatly into part of the 64's screen. The two machines have a great deal in common.

However, you have to watch the PEEK and POKE commands. If there's a SYS, that means that machine language is being invoked, and you may have a major job cutting such programs over. But PEEKs and POKEs are often a straight job of translation. Let's go through VIC memory locations and suggest how to convert them. All addresses in the following list are given in decimal, which is the way you'll see them in BASIC. I'm assuming that the reader has a 64 plus reference material, so I don't need to explain the 64 chips in detail.

For the sake of completeness, I'm making the list quite extensive. You won't meet many of the locations given here, but they are included anyway. The addresses shown for the VIC are for the minimum 5K system.

VIC 0 to 2: These addresses change to 784 to 786 in the 64. Be careful! This is the USR vector and it almost always means that machine language is coming.

VIC 3 to 672: These are the same in the 64. Some of the locations contain different values: we'll note those later. But they perform the same functions.

VIC 673 to 677: "Spare" in the VIC but used in the 64.

VIC 678 to 767: "Spare" in both VIC and 64.

VIC 768 to 783: Same as 64. Be careful, though, about what goes in here: these are the BASIC "links" that rebuild the inner workings of the BASIC language. Playing with these locations can be a delicate job, which will differ between the two machines.

VIC 784 to 787: Not used on the VIC, but the first three locations are used on the 64. See addresses 0 to 2, above.

VIC 788 to 819: Same as the 64. Again, be careful: these are the Kernal "links" that rebuild the way the whole system works. The values you put in here may need to be different between VIC and 64.

VIC 820 to 1023: Same as the 64. Most of this area is the cassette tape buffer, which is often viewed as "unused"... it's used only when tape is active.

VIC 1023 to 4095: This is the 3K memory expansion area of the VIC; I suspect you won't see it used in a VIC program.

VIC 4096 to 7679: On the minimum (5K) VIC, this is the area where your BASIC program goes. Any POKEs here will mean either that the program is trying to modify itself or special data or machine language is being set up. A crude 64 equivalent is 2048 to 40959.

Graphics programs of the VIC often "lift" the start of BASIC and then POKE graphics data down into the lower range of this area. It's hard to indicate an equivalent 64 area for this, although the same technique can be used.

VIC 7680 to 8185: On the minimum (5K) VIC this is the screen memory area. The 64 equivalent is 1024 to 2023, but you must allow for the difference between 22 columns on VIC and 40 columns on the 64.

VIC 8186 to 32767: Memory expansion area. If you see PEEKs or POKEs here the program is assuming an expanded system. This might once again translate to 64 2048 to 40959. If your system is expanded, note that the screen and the BASIC program area will also shift around in the VIC 20.

VIC 32768 to 36863: These are the character "bit maps" in ROM. The same thing exists in the 64, but is harder to get at. The information is in the 64 at 53248 to 57343, but you won't see it there unless you precede it with POKE 56333,127:POKE 1,51 and follow it with POKE 1,55:POKE 56333,129. Don't ever give these POKEs as direct statements, by the way—they must be in a program.

VIC 36864-36867: Video chip locations that have no equivalents on the 64. The "high bits" of the last two locations are part of other VIC activities: they will be mentioned again shortly.

VIC 36868: This value will PEEK the position of the screen raster, together with the "high bit" of 36867. Not too useful in BASIC, but the equivalent in the 64 is 53266 and 53265 "high bit".

VIC 36869: This tells the chip the position of the screen and the character "bit maps". The 64 uses 53272 to do roughly the same thing, but be careful: the rules of use are different. The VIC also uses the "high bit" of 36866 to define the screen location. No equivalent on the 64 for this.

VIC 36280 to 36871: Light pen input. You'll find this in the 64 at 53267 and 53268.

VIC 36872 to 36873: Paddle inputs. The 64 reads 54297 and 54298 for the same thing. But first you'll need to select a paddle using a POKE to 56320—and that calls for a little more tricky footwork.

VIC 36874 to 36877: These are the music voices of the VIC. The "high bit" of these is roughly equivalent to the 64's "key" or "gate" bit in 54276, 54283 and 54290. The remainder is the frequency, which has no easy translation from VIC to 64. VIC waveforms, by the way, are "pulse" type, with the wave getting thinner as we go from 36874 to 36876. 36877 is noise. The "envelope" is similar to an organ: attack=0. decay=0, sustain=15 and release=0. In other words, you may POKE locations 54277, 54284, and 54291 and 0, and locations 54278, 54285, and 54292 with 240.

VIC 36878: The low part of this location is the music volume, which is at location 54296 in the 64. The high part is "multi-color mode". Any change here can be matched by POKE 53270,24 and color with POKE 53282,x on the 64.

VIC 36879: The high part of this number (divide by 16) gives background color, which POKEs to 53281 on the 64. The low part of this number (divide by 8 and keep the remainder) gives border color, which is a POKE to 53280 on the 64.

VIC 37136: The parallel user port: you'll find it on the 64 at 56577.

VIC 37137: This is quite a mixture of things. Probably the most important item is the joystick, which can be detected at 56320 and 56321 (depending on which joystick) on the 64. The bit tests are not the same between the two machines.

VIC 37138: Directional register for the PUP (37136). On the 64 it's 56579.

VIC 37139: Directional register for 37137. No exact equivalent.

VIC 37140 to 37150: A mixture of specialized things. The best suggestion here is to indicate that the VIC uses 6522 VIA chips (start addresses hex 9110 and 9120) and the 64 uses 6526 CIA chips (start addresses hex DC00 and DD00) and that reading up on the details of these chips will suggest the best way to convert an activity.

VIC 37151: Identical to 37137, above.

VIC 37152: Another mixture. Most often used to detect the joystick right condition in the high bit. You'll find this in the 64 at 56320 and 56321. Otherwise, the location is similar to 56320 in the 64.

VIC 37153: Rarely used in BASIC, but similar to 56321 in the 64.

VIC 37154: Mostly used in conjunction with the joystick read (see 37152 above). Otherwise about the same as 56322 in the 64.

VIC 37155: Again, like 56323 in the 64.

VIC 37155 to 37166: See notes for 37140 to

37150, above.

VIC 37167: Same as 37153, above.

VIC 37888 to 38399: This is the "alternate" color nybble area and is not normally used unless you have memory expansion. See the next entry.

VIC 38400 to 38911: Color nybble area. Equivalent to 55296 to 56319 in the 64. Keep in mind that the 64 has a much bigger screen and thus has many more color nybbles.

VIC 40960 to 49151: This is the plug-in ROM area of the VIC. You shouldn't be using it in a simple BASIC program.

VIC 49152 to 57343: This is the ROM that makes BASIC happen. There is an almost precisely identical ROM in the 64 at locations 40960 to 49151. Programs that SYS to this area are probably excessively "clever", but you can get the equivalent 64 SYS address by subtracting 8192 from the VIC number.

VIC 57344 to 65535: This is the ROM that makes the operating system happen. It works the keyboard, screen and peripheral devices and generally keeps the whole computer in order. The same locations in the 64 do the same job but in a different way. SYS commands going here are not likely to work unless you're very lucky.

Just a few words about the contents of some of the lower locations, especially the pointers at addresses 43 to 56. These pointers have the same purpose in the two machines but they will normally contain different values. For example, start-of-BASIC is logged in addresses 43 and 44. That's true of both machines. But minimum VIC 20 BASIC starts at 4097, and 64 BASIC starts at 2049. That means that the 43/44 pointer contains 1,16 for the VIC and 1,8 for the 64. You must be careful when you play with these locations that you do so meaningfully, remembering what part of memory is being referenced.

That's about it. It won't give you all the answers. But it may give 64 owners a feel for the VIC and an idea of how to convert VIC programs. **C**

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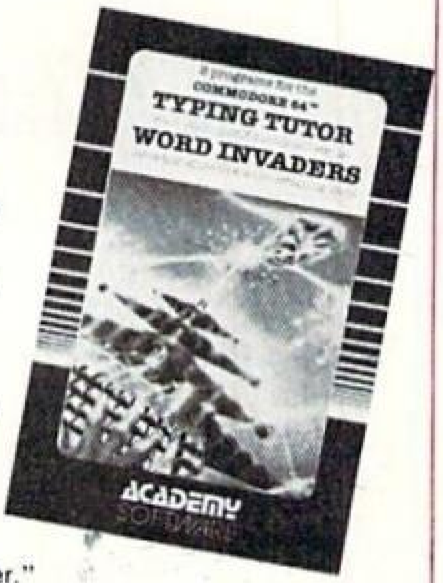

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A Simple Disk Copier for the Commodore 64

by Jim Butterfield

If you have a disk drive for your Commodore 64, program copying may not seem to be much of a task. A simple LOAD followed by a SAVE would seem to do all that is necessary.

There are some programs that don't cooperate, however. For example, there's a class of programs called "boot" (or bootstrap) programs that stitch chunks of memory together to make a system of programs that work together. These programs that make up the system don't look like ordinary BASIC. As a result, LOAD and SAVE, which were designed for BASIC, won't work right. There are other programs that are cantankerous copiers, too—programs containing machine language, for example. Sequential files can't be LOAD-ed, so you can't copy them with LOAD and SAVE, either.

You can often copy a disk by using a backup program. This copies everything over to a new disk. It moves this information over, disk sector by disk sector, so you must copy the whole disk. That's useful, but sometimes you don't want the whole thing... just a program or file or two.

Here's a program that will copy a file for you. If you want to copy two files, run the program twice. You must know the name of the program you want to copy: COPY FILE doesn't read the directory for you. It's just a simple minimum program to do the job.

COPY FILE has a bonus that goes with its simplicity, however. Since this small program doesn't take up much space, it can use lots of memory to do the copying; so it can copy big files. If your Commodore 64 doesn't have any other systems loaded into it—no DOS wedge program, no IEEE interface—you can copy files up to 50K in size. If you are using the wedge or an interface, you'll have to restrict yourself to smaller programs—probably not over 35K or so. But that's still plenty big.

Running the Program

Before running COPY FILE, make sure you have two disks ready—the one you want to copy from, and the one to which you want to write the copy. Be sure you know the names of the files—make a note if necessary. The "destination" disk must be formatted. It can already contain other programs and files, since the new material will be added.

Load and run COPY FILE. You'll be asked for the file type. You may answer S for Sequential, U for User (a rare file type) or P for Program. Program COPY FILE will not copy relative files.

Next, you'll be asked for the name of the program or file you wish to copy. Type in the name, and be sure it's correct. Press RETURN and COPY FILE will look for the file you have named.

If it can't find the file or if it sees other problems, it will reply NO GO. Otherwise, it will ask OTHER DISK READY? Take the old disk out of the drive, put the new disk in and answer anything. A letter Y followed by a RETURN will do the trick. The file will now be written to the new disk.

Watch for signs of disk errors. The destination disk might have problems. Perhaps it hasn't been formatted, or has a write protect tab in place, or already has a file of that name, or hasn't enough room for the program you wish to copy. In any of these cases, the disk error light will flash.

But normally, the file will be copied. To copy another, say RUN and COPY FILE will do it again.

Where's the Program?

I'd like to list program COPY FILE for you and let you type it in... but there's a problem. The program contains a machine language part. That's tricky to type in, even if you have a machine language monitor. The smallest mistake, and you're out of business.

So I've decided to go a different route. Instead of having you type in the program, I've set things up so that the program will be written for you. The listing that follows contains not COPY FILE but a *program generator* that will produce COPY FILE for you.

What's a program generator? It's a program that writes a program. Why bother doing that? Because the program generator will check things very closely for errors. There's little chance that you'll make a mistake in the data statements that eventually create COPY FILE for you.

Type in lines 210 onward very carefully. Be especially careful that you don't forget the semicolon at the end of line 300.

Now start working on the data lines. Don't worry too much about accuracy. If you make a mistake, the generator program will almost certainly pick it up and tell you about it. And it won't write program COPY FILE 64 to disk until you have gotten all the data statements right.

In fact, you can type in some of the data lines and try a RUN before you're finished. COPY FILE will check what you've done and tell you what's missing.

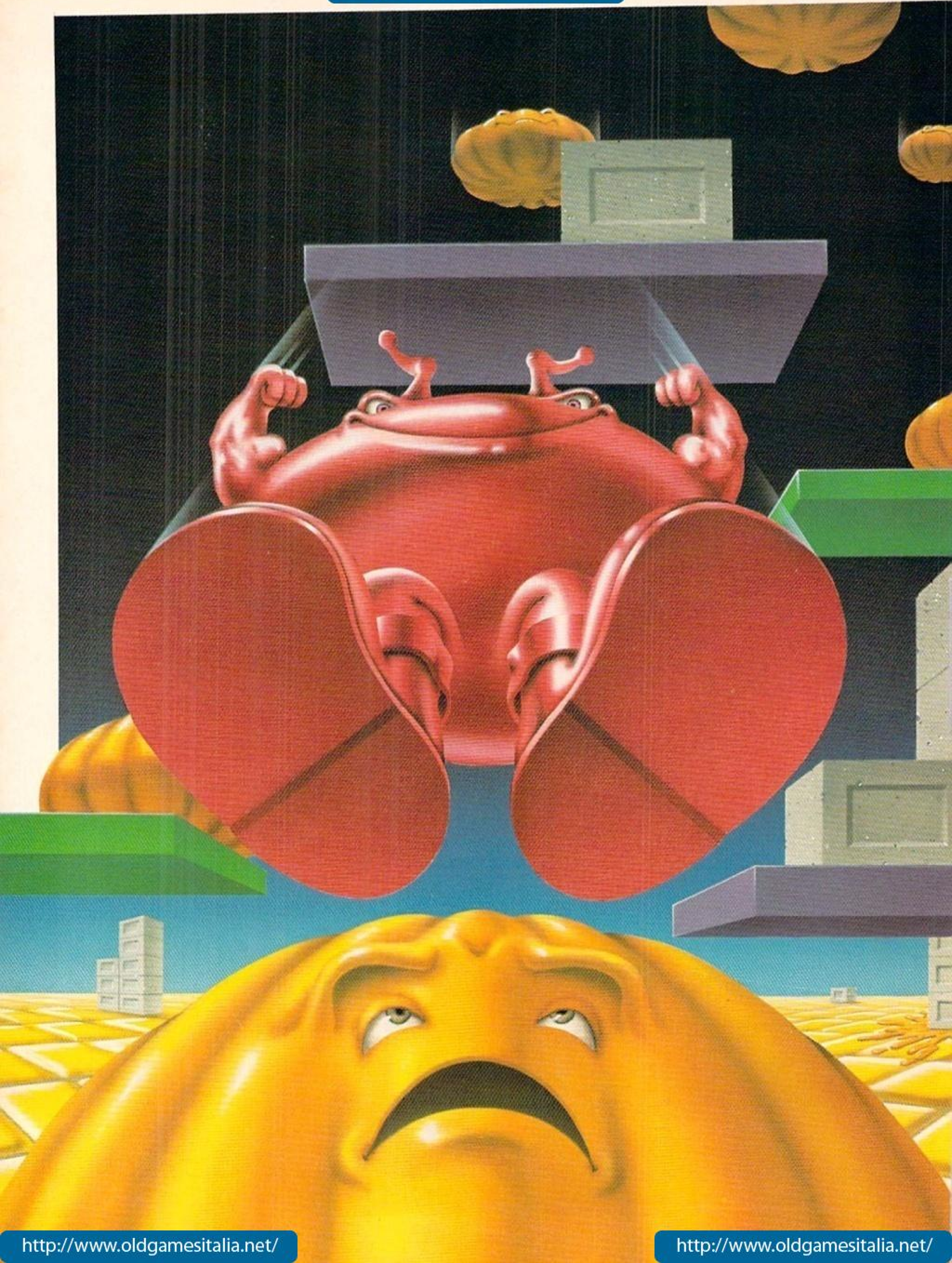
It's nice to feel that you can't make a mistake in typing in this program. It gives you a sense of security. But the point of program generator is to give you program COPY FILE 64. And if you need to copy a file, COPY FILE 64 will be very useful.

There are other, bigger, copying programs that read the directory and check for errors and help you with other good things. But if you don't happen to have one of those, COPY FILE 64 will come in handy. **C**

Generator for COPY FILE 64

```
1 DATA 1,8,18,8,80,0,151,53,-53
2 DATA 49,44,56,52,58,151,53,50,
  -10
3 DATA 44,57,0,55,8,90,0,133,-19
4 DATA 34,70,73,76,69,32,84,89,
  -42
5 DATA 80,69,32,32,83,157,157,
  157,-37
6 DATA 34,59,84,36,58,133,34,70,
  -3
7 DATA 73,76,69,34,59,88,36,0,-29
8 DATA 75,8,100,0,159,49,44,56,
  -14
9 DATA 44,50,44,88,36,58,158,50,
  -8
10 DATA 50,50,51,0,98,8,105,0,-61
11 DATA 139,83,84,179,177,54,52,
   167,-23
12 DATA 153,34,78,79,32,71,79,34,
   -57
13 DATA 58,144,0,128,8,120,0,160,
   -2
14 DATA 49,58,133,34,79,84,72,69,
   -47
15 DATA 82,32,68,73,83,75,32,82,
   -49
16 DATA 69,65,68,89,34,59,65,36,
   -48
17 DATA 0,171,8,130,0,139,195,40,
   -23
18 DATA 65,36,41,167,159,32,49,
   44,-22
19 DATA 56,44,50,44,88,36,170,34,
   -32
20 DATA 44,34,170,84,36,170,34,
   44,-61
21 DATA 87,34,58,158,50,50,54,55,
   -20
22 DATA 58,160,49,0,0,0,0,0,-38
23 DATA 32,7,9,162,1,32,198,255,
   -30
24 DATA 32,228,255,160,0,145,251,
   230,-12
25 DATA 251,208,8,230,252,165,
   252,201,-43
26 DATA  208,240,4,165,144,240,
   233,165,-50
27 DATA 251,141,64,3,165,252,141,
   65,-54
```

(Continued on page 64)



Verlin Miller

Illustration — Verlin Miller

JACK'S ALMANAC

By Steve Finkel,
Commodore Software Division

Jack Attack is an original strategy/action arcade game from Commodore, with versions for the VIC 20, Commodore 64 and Commodore 264.

The star of *Jack Attack* is a little red fellow who is known as Jack. In a world filled with blocks, platforms and bouncing, rotating heads, Jack must be both intelligent and skilled to survive and prosper. He must squash the heads before they squash him, arrange the blocks to reach platforms to score bonus points, beat the timer for more bonus points in each round, and conquer as many of the 64 different levels as he can before his brains and reflexes are surpassed by the complexity of the level. *Nobody* has ever succeeded in finishing all the levels… yet.

This almanac divulges much of the background behind *Jack Attack*, containing lots of inside information heretofore available only to industrial spies, and even more information based on complete fabrication.

On the Name Game

The name of anything—game, person, singing group, etc.—often has a profound effect on its bearer. It's an established fact, for instance, that a child's name will be a key factor in that child's development. A child named Horace will undoubtedly be taunted throughout his early adolescence for either poor eyesight, being overweight or both. A girl named Cheryl, Suzanne, or Racquel has a good shot at being attractive. The best a girl named Ethel can hope for is a pleasant personality. Name your son Buck and you've effectively eliminated the possibility that he'll be a florist.

This principle applied itself to *Jack Attack* with a passion. The name of a computer game is supposed to give the buying public an indication of the elements of the game while arousing their curiosity. The name becomes the game's image. As such, a game called "Dusting the Furniture" would probably not be a big seller, since the name calls to mind a menial household task. (In my experience, menial household tasks don't usually cause a flood of enthusiasm.) Conversely, a game called "Rescue the Beautiful Maiden from the Cossacks while Galaxies Collide and Exploding Aliens Fire Lasers" might be just a bit much. And a game named "Horace" will probably be laughed at by the general public. The issue at hand, then, was exactly what to call this game.

Our original goal was to capture the elements of the game with the title. Initially, the game was known as "Cubik Critters" or "Cubik". Everyone became used to this name and we felt that it was an apt description, because of the role of blocks in the game. Then it was pointed out that there would be more than a little confusion between "Cubik" and other similarly-titled computer games and the great name hunt was on!

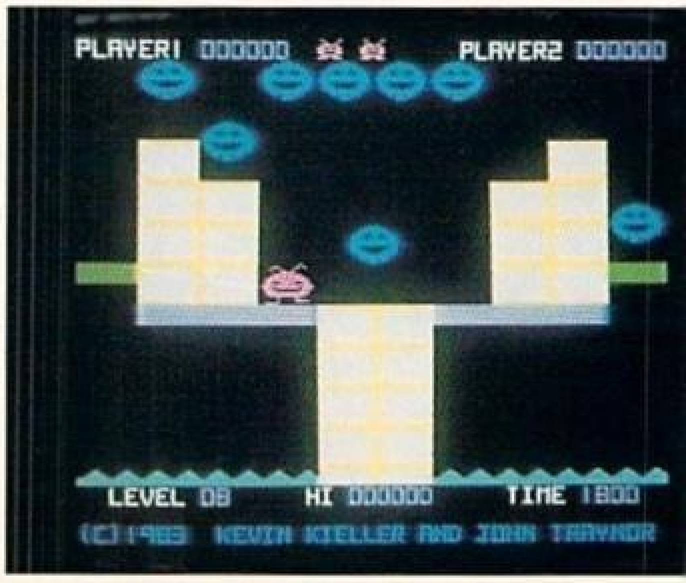
Although most rejected suggestions were drenched with lighter fluid, burned, and the remaining ashes delivered via special courier to the Aleutian Islands to be scattered over the icy Pacific, I still maintained a partial list. Some ideas (Blockheads, Blocksmith, Noggin Stompers, Squish 'em, Heads Up!, Cubicles) were seriously considered and rejected. Others (The Block Plague, Beheaded, Squeegee, Block Party, Headaches, Blockades) were virtually ignored, while still others (Better Red Than Heads, Head Cheese, Bagels and Blox, Heads Will Roll, Horace, and several other unprintables) were held up to scorn and ridicule.

Some suggestions turned out to be the precipitating factors in the dismissal of several employees (Heady Lamarr, Block-A-Doodle-Doo, The Block Stops Here, Sergeant Pepper's Lonely Heads Club Band, and the completely incomprehensible suggestion to call the game Nosebleed). The employees in question turned to the Labor Relations Board, who not only agreed with their dismissal but swore that they'd never work in this country again. As you can see, the naming of the game turned out to be a rather difficult task.

Facing the possibility of releasing a game without a title (an eventuality that would more than likely hurt sales), we undertook a new approach. Rather than relate the title to the elements of the game, we decided to relate the elements of the game to the title. (Even as I write this, I can envision readers wrinkling their brows in an unsuccessful attempt to fathom that last statement.)

The central character of the game—the little red guy with wiggling antennae and stamping feet—was known only as a "critter" or "the little red guy." The little red guy is the protagonist; you directly control him, making him jump, push and pull blocks, bounce on platforms, etc. How well you use him determines your score. Rather than name the game for the obstacles or enemies, we decided to name it after the hero—the little red guy with wiggling antennae and stamping feet. Since the marketing department protested against calling the game "The Little Red Guy with Wiggling Antennae and Stamping Feet Game", we knew we would have to come up with an official name for him. Which brings us back to our original dilemma of choosing a name.

After abortive attempts at using foreign languages by borrowing words or terms (picture frantic thumbing through Spanish and French dictionaries searching for an acceptable name for the



little fella) and trying to develop something unusual using the less popular letters of the alphabet (.. Zyx-no... Jyqzon-no... Vuxiz-no..), we went for the

JACTIONARY

Glossary of *Jack Attack* Terminology

Block and a Hard Place: The act of squashing a head by arranging blocks so that there is a space between two blocks on a level surface. When the head bounces into the space, Jack shoves the blocks together. Effective way to squash low-bouncing heads.

Blocking Out: In certain levels, when Jack finds himself on a ledge with virtually no room to operate, he uses a process of pushing and pulling blocks to create an area that allows him freedom to move and pounce.

Bulldozing: Pushing three or more blocks along a surface, either the platform or the floor.

Cornering: Heads always bounce twice at the extreme left and right sides of the screen before bouncing across. This gives Jack an advantage, since he can time the second bounce to squash the head without worrying about having it advance toward him.

less conventional. Jack is a fairly common name, and not what you'd expect the average little foot-stamping, antennae-wiggling red guy to be called. But to further consider: most Jacks you meet are pretty likable. And Jack is often linked with fun: consider Jack o'Lanterns, Jack-in-the-boxes, and the game of jacks.

Jacks are also generally thought of as skilled and versatile, as in Jack-of-all-trades. And, finally, Jack is also a generic term used when addressing someone, as in "I'm all right, Jack" or "Hit the road, Jack".

> He always maintains his cool, hiding any anxiety or panic behind a constant smile.

The versatile character that the name Jack conveys, therefore, fits the personality of the little red guy. After only a brief flurry of counter-suggestions (Jumping Jacks, Jack and the Blocks), we settled on *Jack Attack*. As it turned out, we came up with the name just in the nick of time, since marketing was starting to seriously consider calling the game "Nosebleed".

On the Video Game Protagonist

Let us examine our central figure more closely. Jack is not unlike several of the great heroes and protagonists of legend and literature. The enormous strength he exhibits, shoving huge blocks together and pulling them across elevated platforms, is reminiscent of the feats of Hercules or Superman. The athletic grace with which Jack cavorts among the blocks and platforms brings to mind Tarzan swinging through treetops. And it is hard to overlook the striking similarity between Jack and Fred Astaire, considering how light Jack is on his feet.

Another of Jack's traits is his total lack of fear. No matter how many heads cascade down around him, he always maintains his cool, hiding any anxiety or panic behind a constant smile. Jack, defiantly wiggling his antennae, shows his indomitable spirit, derring-do, a touch of bravado. In this respect, he is not unlike Dumas' Musketeers or the dashing Sir Lancelot. (Right about now, if you feel that I'm stretching the point, you're right.)

Rudyard Kipling had some real insight into Jack's nature. Gunga Din, for instance, was famed for his ability to take abuse and still produce in the clutch. And a famous Kipling poem begins, "If you can keep your head when all about you are losing theirs. . . ." Do you think it's possible that Kipling anticipated the game *Jack Attack*?

When you get right down to it, your Jack is what you make of him. . . he can be a swashbuckling little red Douglas Fairbanks or a bumbling Inspector Clouseau with wiggling antennae.

If he could think, what might be going through Jack's mind as he faces the threatening advances of the heads, hanging over him at the top of the screen like puffy rotating Swords of Damocles? Would he delight in bringing about their collective demise, or just look upon it

Cotton, Eric: Commodore programmer who helped develop *Jack Attack,* known chiefly for the phrase "I don't like sports games on computers". Luckily, *Jack Attack* is not a sports game.

Double Back: Often referred to as "The Old Double Back", this happens when your Jack is closely following a head in an effort to squash it. With no warning, the head reverses direction and bounces on your Jack.

Double: This is when Jack squashes two heads that are on top of each other by jumping on them.

Headraulic Squash: Timing your Jack's vertical jump to land on a low-bouncing head passing underneath him. A sophisticated and useful move.

Headroplaning: Jack occasionally bounces off a head sideways that he should have squashed. This can get him into trouble, since he may end up in water or at the bottom of a deep block ravine.

High Dive: Jumping down on the final head from a high column of blocks into a ravine that Jack cannot get out of by jumping or moving blocks. Often a spectacular way to finish a level, but if there's more than one head left or your Jack misses, it might not seem too spectacular.

Jackass: Someone who continually makes excuses each time a Jack gets squashed. A favorite alibi is blaming it on the joystick. We are all Jackasses to some degree.

Jackpot: Scoring both the platform bonus and a large time bonus in a round.

Kieller & Traynor (Kevin and John): Two Canadian teenagers who took a break from playing hockey

Continued

as the survival of the fittest? Would he tend toward creativity, arranging elegant traps and pitfalls with the blocks to eliminate the heads with a touch of *elan*, or go about it in a straight, business-like manner? Since you function as Jack's mind and personality, that is up to you. My Jack likes to go after the heads with sarcastic, sometimes sadistic, glee. He really enjoys dropping down on the heads from great heights, and making double and even triple squashes. There is actually an art to it, although appreciating that art is probably a subjective matter.

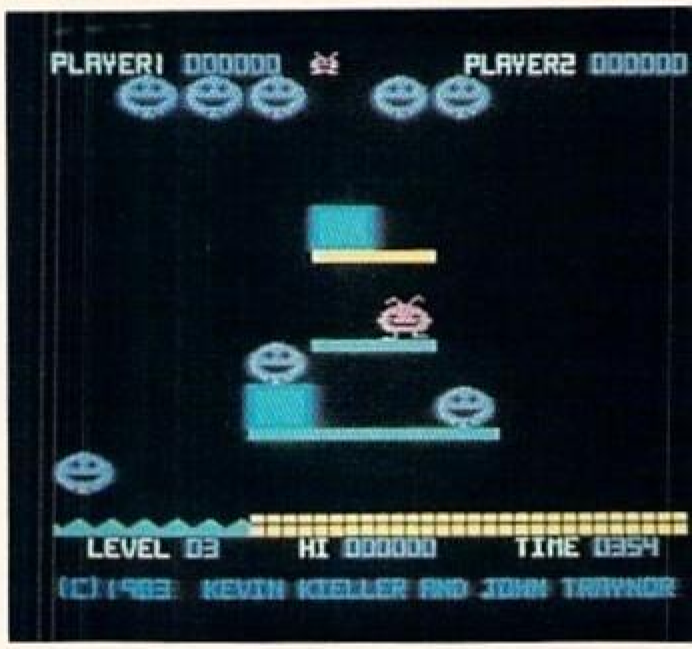
On Shapes

It has often been said that perfection can be found in geometrical shapes. Some shapes achieve perfection through symmetry, like a square or circle. Still other shapes fail to achieve this perfection, such as the "ink-blot" or "radish" shape.

When choosing a shape that will form the heart of a game, it is wise to consider all the manifestations of possible shapes. In *Jack Attack*, squares were ruled out immediately, since they are not only dull but still retain a lot of negative feelings from the Middle Ages. As soon as it was discovered that the world was actually round, people resented the square for misleading them for so long, and this enmity has yet to be completely erased by time. Ditto for circles, since we now think that the world is egg-shaped rather than round. Also, circles don't stack too well. Why not egg shapes, you wonder? Consider the relationship between the rotating heads and the primary shape obstacles, and then think if you really want there to be a game on the market that could so readily be called "Eggheads". Triangles might remind people of the infamous "Bermuda Triangle", and we wouldn't want that.

We couldn't afford to use diamonds (mediocre pun, ignore it), forgot exactly what rhomboids are (it's been a long time since seventh-grade geometry) and dismissed an assortment of parallelograms, pyramids, cones, parabolas and hyperbolas for various reasons. We could barely pronounce tetrahedron, let alone draw the thing.

However, rectangles offered an intriguing range of possibilities (if you're easily intrigued). The sides are not of uniform length, but



and eating back bacon to create *Jack Attack*, originally naming it "Cubic Critters".

Long Distance Squash: Pushing a block or row of blocks down a "valley" created by two tall columns of blocks to mash a head. An artistic squash.

Manhandling: Using a block to push a head over the edge of a column, waiting until the head falls and then dropping the block on top of the head.

Pair Snare: Squashing two heads at once between two blocks using the same procedure described in "Block and a Hard Place".

Scotch: Term for a level in which the blocks are arranged to alternate two- or three-block high columns with empty columns. Jack can survive only by jumping down to squash a head and then back up to the top of a column, down, back up, etc.

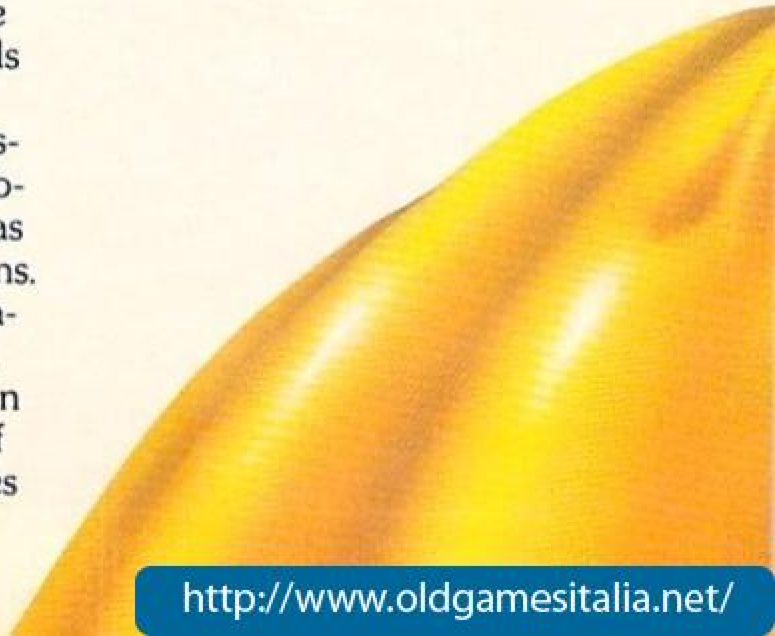
Sideswipe: Pushing a head off the side of the screen with a block.

Sneak Play: When a head bounces high, Jack slips under it and squashes it from the other side. This move is usually used to reach a platform, and takes real skill and judgment to pull off.

Stepdown: Sliding your Jack off a single block to squash a head bouncing along the floor at a high speed. The height advantage makes a tough head easy to get.

Triples: Squashing a pile of heads three high by jumping on them. One of the most difficult maneuvers in the game.

Twinning Up: When two heads seem to attach themselves, and bounce up and down together for



rectangles are stackable. The lack of negative preconceptions about rectangles was also a plus. As a shape in our culture, rectangles maintain a low profile. There has never been a "rectangular deal" promised by a politician, no "vicious rectangles", no tragic "love rectangles". Basically, rectangles have been keeping their noses clean.

This is not to suggest that rectangles are staid and unimaginative. Squares are. Rectangles come in all sizes and colors. In fact, it is rumored that Joyce Kilmer's first draft of the poetry classic "Trees" actually read:

"I think that I shall never wangle
a poem lovely as a rectangle."

Of course, rumors are often false. And, believe it or not, the playful character Puck in Shakespeare's *Midsummer Night's Dream* was originally known as "Block". Although the name was altered through the years as a result of chronic mispronunciation, it of course derived from Shakespeare's healthy respect for and warm feelings toward rectangles. Coincidentally, the Bard had an intense dislike for circles, as evidenced by Lady Macbeth's infamous cry of "Out, out damned spot!" If the immortal Bard's own shape preference ran toward rectangles, Jack is proud to be able to use them to squash rotating heads.

On Gamers and Other Life Forms

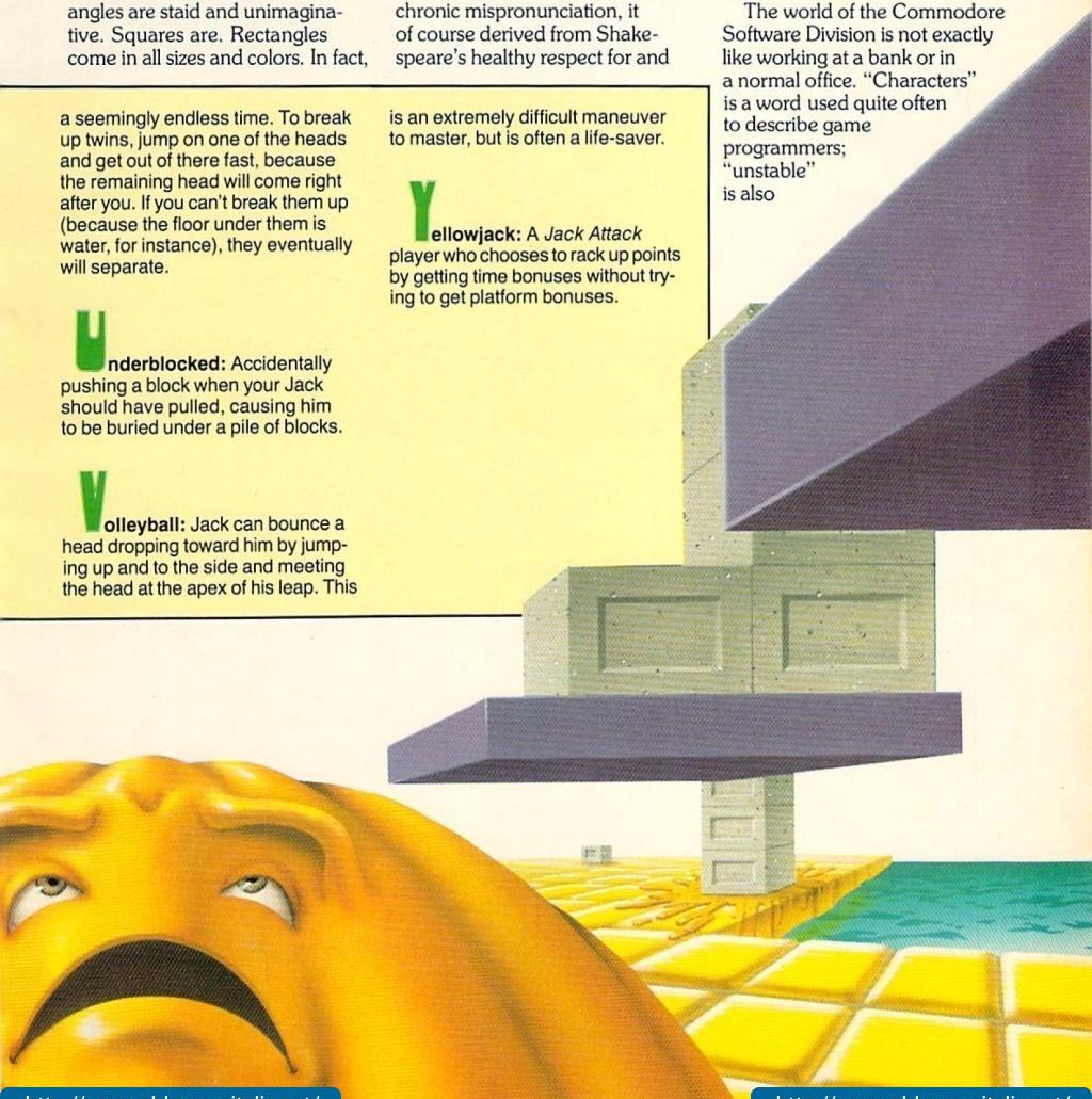
The world of the Commodore Software Division is not exactly like working at a bank or in a normal office. "Characters" is a word used quite often to describe game programmers; "unstable" is also

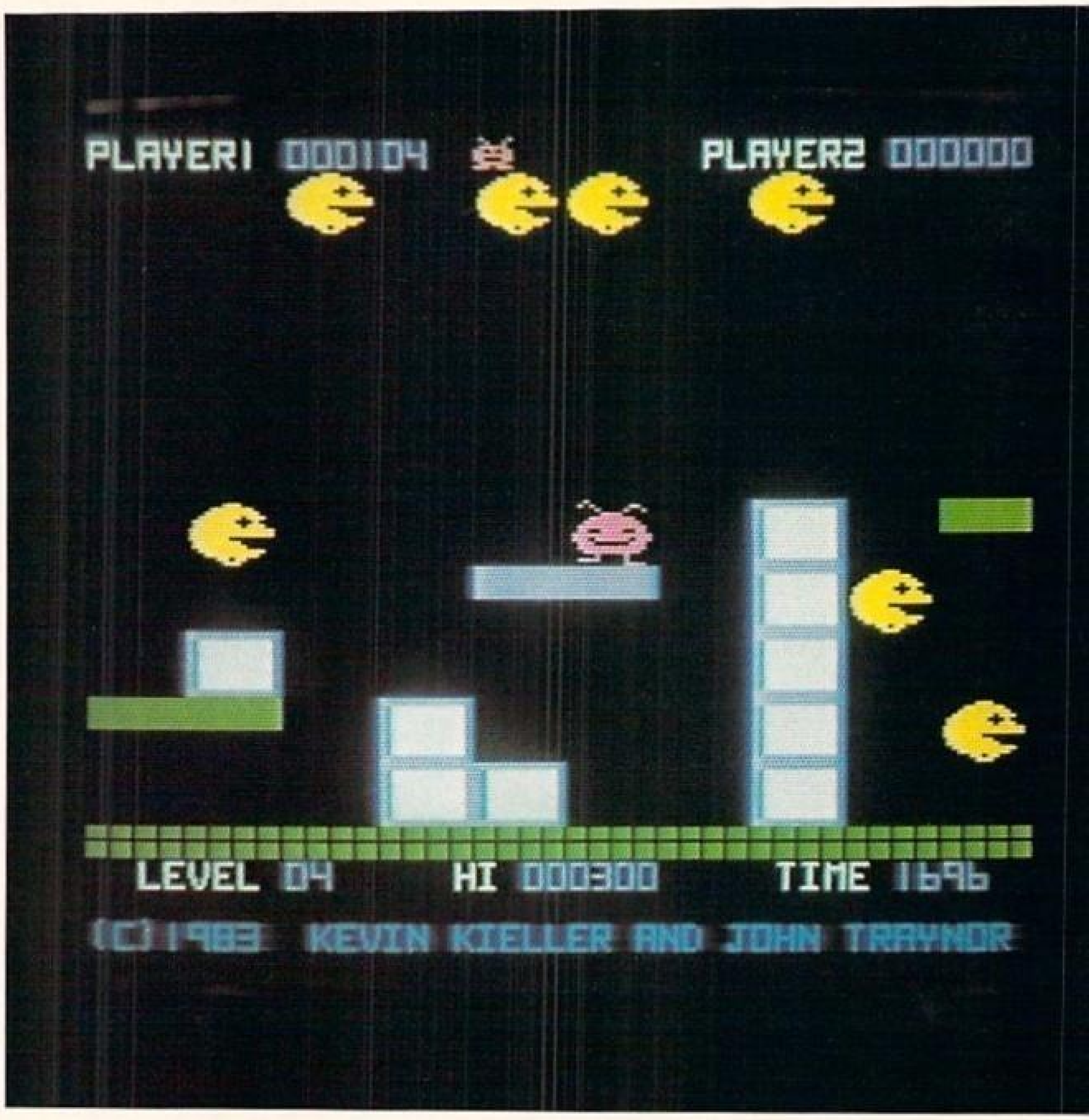
a seemingly endless time. To break up twins, jump on one of the heads and get out of there fast, because the remaining head will come right after you. If you can't break them up (because the floor under them is water, for instance), they eventually will separate.

Underblocked: Accidentally pushing a block when your Jack should have pulled, causing him to be buried under a pile of blocks.

Volleyball: Jack can bounce a head dropping toward him by jumping up and to the side and meeting the head at the apex of his leap. This is an extremely difficult maneuver to master, but is often a life-saver.

Yellowjack: A *Jack Attack* player who chooses to rack up points by getting time bonuses without trying to get platform bonuses.





another popular choice. This is not to suggest that our software department is a proverbial Disneyland filled with mad geniuses frantically devising games, with occasional peals of maniacal laughter that pierce the creative stillness signifying yet another high score. As a matter of fact, the games group members take their game-playing very seriously.

In the course of developing, reviewing and testing games, certain games will become extremely popular with the group. Game programmers, since they are around computers and games so much of the time, develop a kind of sixth sense about playing games. They almost instinctively know how to get the biggest bonus score, the fastest way to complete a round, or the best strategy to get extra men. It's as if they can communicate with the software on another level, in a different plane. This bond between creator and creation is not specific to the game or the programmer. As Will Rogers never met a man he didn't like, I have yet to come across a programmer who couldn't play games.

Someone who knows his way around a joystick or arcade is known (around here, anyway) as a "gamer". This is the ultimate compliment for the accomplished game-player. While programmers all seem to be natural gamers, a layperson must demonstrate a special talent to be labeled a gamer. There are a handful of gamers who aren't programmers around Commodore. The Software Department librarian is a gamer. The ever-popular Neil Harris, erstwhile publishing manager of Commodore magazines, qualifies as a gamer. And, even though my native humility does not permit me to brag excessively, I have become a top-notch gamer.

In an office full of gamers, there are bound to be ego clashes and disagreements over who is best at what games. The way the software area at Commodore is set up, there are dozens of cubicles formed by five-foot high walls, which do not prevent other people from seeing or hearing what you're doing at your desk. The result is that everyone knows what game everyone else is playing, and how much practice they're getting.

In my own case, if I couldn't be found at my desk playing *Jack Attack* right after lunch (helped my digestion, I claimed) or after work (helped me unwind), people assumed that there was a fire drill on, that my car was being stolen, I had been kidnapped, etc. Once, in fact, the FBI was even called in.

But these incidents were few and far between, since *Jack Attack* had challenged me and captured my attention like no game before or since so I was usually glued to my desk. All of which leads me to stake my claim of being the best Jack Attacker in the world. Since the pool of Jack players is limited at this point in time and I know that the creators of the game have not matched my high score, I feel pretty confident about this statement.

Unfortunately, some of my coworkers dispute this claim, and according to the International Federation of Gamers* by-laws, we can settle this disagreement only by competing in a supervised, legally-binding tournament. Right now, we're lining up sponsors. The Vegas line has pegged me as a slight underdog, but I consider myself the sentimental favorite (my mother's, anyway).

Nevertheless, performance is what separates the real Jack from every Tom, Dick and Harry. So you can be sure that only a struggle every bit as intense as Rocky's rematch with Apollo Creed and as hotly contested as the annual Texas-Oklahoma football game will answer the burning question. But not in this article. **C**

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*The International Federation of Gamers is a totally fictitious organization that I made up just now to go in this article.

I'm All Right, Jack.

By Mr. X

My problems started when I grabbed the joystick. The blocks fell into a configuration on the tile floor at the bottom of the screen, the heads hovered in a line at the top. On the floor, stamping his feet and wiggling his antennae in anticipation, was a little red fella whose name I later learned was Jack. The timer ticked off units as heads began to plunge majestically floorward. Jack, cool smile on his face not betraying any sign of inner turmoil, poised for the attack.

Cascading lazily down at first, the heads picked up speed and aggressiveness once they hit the ground. Jack leaped on and off piles of blocks, pushing and pulling them to gain a strategic advantage against his opponents. The heads continued to fall, trying to bounce on Jack to crush him. Jack was too quick; he squashed heads between blocks and jumped on them, until there were none remaining. Then it was time for round two.

The ensuing 63 levels are all arranged differently, with new elements added. Platforms that change color when Jack lands on them create an opportunity for bonus points if Jack is able to touch all the platforms before the timer expires. Instead of tile on the floor, there are spaces filled with water. Jack is wary of these areas, knowing that the heads can cavort freely on top of the water while he would sink like a skydiver who forgot his parachute. Through it all, Jack continues to smile, wiggle his antennae and stamp his feet in silent defiance.

I played *Jack Attack* well into the night that first time. I'd never done anything so exhilarating (except for maybe that time I climbed Mt. McKinley). There were so many challenges, different levels, strategies to develop, thinking combined with pure reflex action... the rising sun cast a pale glow on my still active monitor screen. I ignored it and continued playing.

In the next few weeks, my interest grew rather than diminished. I began to get an uncontrollable urge to jump up on any nearby platform. This was occasionally embarrassing—once I leaped onto a window washer's plank that was being raised from the ground floor. They had to call the fire department to get me off the ledge I was clinging to.

When I drove my car, I felt that the other cars were blocks that I could maneuver around the highway by shoving them with my own car to create an advantageous formation to combat the falling heads. My insurance rates skyrocketed.

At this point, my friends and relatives were starting to get a little worried. My refusal to go into bathrooms with tile floors fed their suspicions. I began walking with my eyes focused directly above me so I would be ready to react quickly to the heads when they started falling. I began to continually stamp my feet and wore a constant smile on my face. This usually caused people to react negatively to me, particularly security people in department stores. However, this was occasionally a plus, since nobody dared to sit next to me on public transportation. I then began to dye my skin red. I began to grow real antennae. That's when I knew I had it bad. I checked into the State Home for Jack Attack Victims.

My convalescence at the Home was not what I expected. The therapy consisted of discussion groups with other J.A. victims (I picked up some great pointers to get the platform and time bonuses in levels 15, 37 and 52), routine game practice periods and antennae trimming, all designed to help us form more responsible *Jack Attack* behavior patterns. After a short while, I was able to view reality from a more reasonable perspective, and my own life resumed its somewhat normal course.

I'm not saying that I gave up Jack, or that I became a "closet Jack player". It's not like cigarettes or alcoholism, but it is addictive in its own way. Each level is more challenging than the last, so I never tire of it. I don't feel it is a monkey on my back... quite the opposite, in fact. While some people toss money away in cigarette machines, arcade coin slots and on other expensive toys, I just have to press the fire button to feed my habit. And you can hardly see the red dye anymore. C

Barb in Computer Wonderland

By Barbara Kelter

A student at Iona College in New Rochelle, New York, Barbara wrote this story as her final paper for Computer Science 334. It was submitted to us by her professor, S. L. Tuohy. The format is a far cry from the usual "techie" approach and provides a genuinely informative overview of how computer systems work that we think you'll enjoy reading. We've included Barbara's bibliography as well, since many of the references are classics in the field that are certainly worth looking into.

I was walking by the microcomputer lab one sunny day and I saw that a class was going on. I thought, "I'll probably have to use a micro in my work one day," so I joined the class. The professor was a nice fellow and on the first day he taught us some system commands like LIST, RUN, LOAD, and SAVE. I ran a few simple BASIC programs and when the class was over the professor gave us a magazine article to read.

But as I went from school to the corner to catch the bus, something very odd happened. There was an extra walk button on the street pole. Being the curious sort, I pressed the button on the right and to my surprise the light turned red. I saw the bus coming down the street and I was afraid I was going to miss it, but when it got to my corner it stopped and the light turned green. I ran across the street and got on the bus but as it

F
E
D
7
ASCII-LAND
CHR$-LAND
E
8
4
6
DECIMAL
R$-LAND
ASCII-LAND
HEX-LAND
B

Illustration—Jean Gardner

started up I noticed that it was not the Westchester 3. The sign said "IEEE". I thought, "Oh no. I'm going to end up in Hohokus. I wish I had never moved from the plains of Nebraska."

> *Step into these silicon shoes, click your heels three times and repeat, 'There's no place like home'."*

When the bus stopped I was in a strange land. The sign at the bus terminal said ASCII, population 8 bits (255 decimal, FF hexidecimal). I started to get off the bus, but the bus driver said, "You can't get off without paying!"

I asked, "How much is it?"

He said, "One magazine article."

"What kind of article?"

"What kind do you have?"

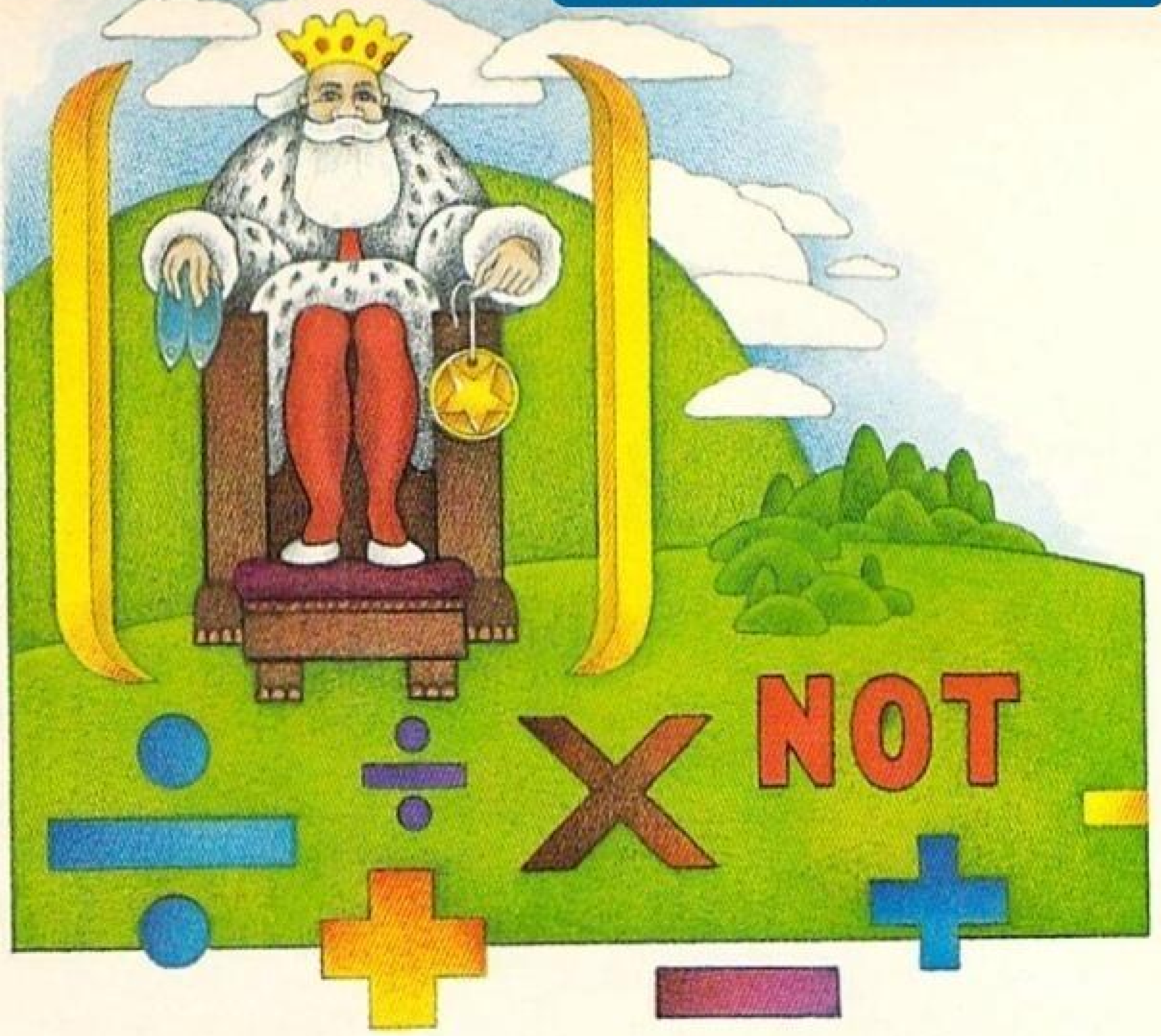
I told him I had an article called "Personal Computers." He wanted to know what it was about. I told him it was about the advances we had made in computers in the last 25 years. It defines what a personal computer is (a stand alone computer that puts a wide array of capabilities at the disposal of the individual). It also describes the memory, CPU, and peripherals that can go with a micro. The bus driver thought that it was a pretty good article, and gave me a different article as change.

As I walked down the street of ASCII-land I noticed the people weren't ordinary looking people. They all looked like numbers. Across the river was another country called CHR$-land. There was a bridge between the two countries, however. Whenever a citizen of CHR$-land crossed over the bridge to ASCII-land he turned into a number, and whenever anyone crossed from ASCII-land to CHR$-land he turned into a single character. I saw another bridge under construction. The engineers were scratching their heads, so I went over and asked, "What's the problem?"

One of the engineers said, "We're building a bridge from Decimal-land to Hex-land by way of ASCII-land, but when a hex letter enters the bridge, he comes out too big. For instance, this hex letter B came out as a 66 in ASCII-land. When he goes to Decimal-land, he will be a B rather than an 11."

I said, "I know what's wrong! If the hex digit is between A and F then you must subtract seven because there are seven characters between 57 (the ASCII representation of nine) and 65 (the ASCII representation of A)."

The engineers made a few changes, and then a B from Hex-land walked across the bridge and came out as two ASCII 49's paired together. They then went across the bridge to Decimal-land, and came out as an 11. I said, "To get back from Decimal-land to Hex-land you must add seven to the ASCII number if the decimal digit is greater than nine."



The engineers thanked me profusely, and told me I must go to the Grand Order of Operations to receive a medal. So I headed off for the Grand Order of Operations. Soon a great mountain rose before me. The bottom of the mountain was surrounded by OR's, above them were AND's and above them, but all on one level, were equals, greater thans, and less thans. The air was getting thin when I reached the pluses and minuses. The multiplies and divides were even higher, and the upward arrows of exponentiation were higher than that. The NOT's were almost at the top.

When I reached the top, who did I see but King Parentheses. He gave me a lovely medal with a CHR$-land star on one side and its ASCII-land representation on the other side. The King then said, "As a reward I will take that magazine article off your hands. It's about the hardware and software designed by the University of Waterloo and their view of the role of the personal computer in the future. Also I want to send you to the Land of Happy Memories. Step into these silicon shoes, click your heels three times and repeat, 'There's no place like home'."

I did as told, and all of a sudden I was surrounded by a picture of Nebraska with a corn plant in the center. There were a lot of furry green things scurrying about. I stopped one and said, "Who are you?"

He said, "I'm a Poke. I'm a messenger boy of the Land of Happy Memories. When someone from the outside world wants to have a message delivered to an address, we deliver the message. Right before you came we had a huge order to the Land of Happy Screen Memories."

I saw an orange furry thing whiz by. "That one was orange!" I said.

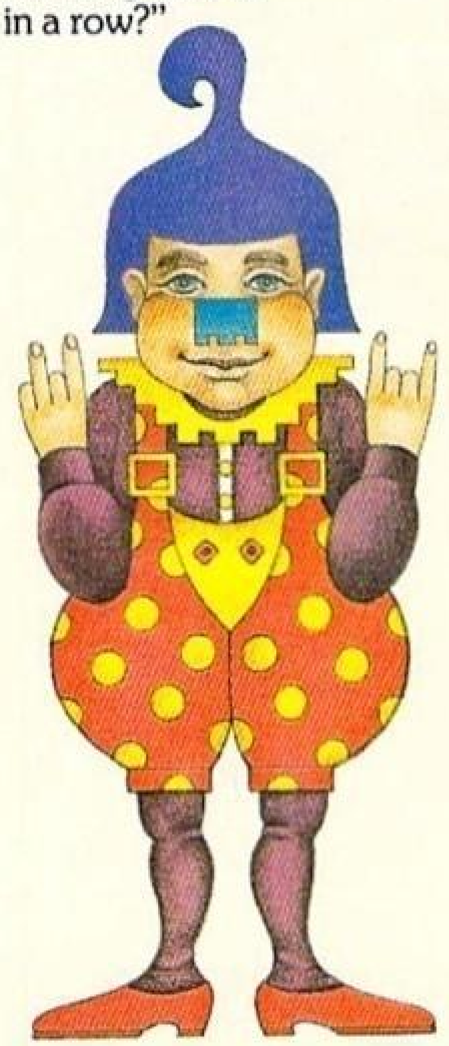
The Poke said, "That was my cousin Peek. He takes messages from the houses of the Land of Happy Memories and delivers them to the outside world."

"How do you know which house to go to? They all look the same to me."

"Oh, they have addresses on them. For instance, the Land of Happy Screen Memories stretches from 8000 hex drive to 8FFF hex drive. I'm sorry, I've got to run now; I'm late for my delivery. Doing a logo isn't bad, but these animations really keep us busy."

I went on my way through the Land of Happy Memories, and soon came upon a magazine stand. I bought a magazine article called "Meet the Micros." It compared the CPU, memory and microprocessors of different micros.

I walked a long way, and finally I came upon 033A hex drive, where a number of funny looking men were standing in rows. They each had four fingers on each hand, a large square blue nose and a big purple curl on the top of their heads. I stopped and asked, "Why are you standing here all in a row?"



One of them said, "We are the Machine Language Men. We hold the numbers given to us by the BASIC machine language program. For instance, when I hold up the second and fourth finger of my right hand and the first and fourth finger of my left hand, that signals A9, which means to load the A register with the number that follows. We are very important. With just a few commands we can control the whole computer. We use a number of styles of addressing. There is immediate addressing, which uses the next number given in the program; absolute addressing, which uses the element in the location of the next number given; and zero-page addressing, which uses whatever number is next as the low byte of the address and 00 as the high byte of the address. Absolute, X and Absolute, Y addressing use the absolute address plus the X or Y register as the address. This is good for indexing arrays. There is also indexed indirect addressing and indirect indexed addressing."

A shiny new train pulled up just then. The Machine Language Man said, "We can also take you on the JSR express to some built-in routines. Hop aboard. Here is FFD2 hex drive. It is a print routine to the screen. FFE4 is a get-character routine, and FFC4 is an input-character routine. Don't be intimidated by the built-in routines. They just consist of Machine Language Men like me, only they live in those spots permanently. Their routines are just as easy to dissect as any other assembly routine. There are easier ways to program us than through the BASIC machine language program. There is the monitor, and best of all, supermon. Supermon can assemble and disassemble our routines.

"Now I will show you some special locations," the Machine Language Man went on. "Here at 0202 hex drive lives the Status Register Man."

"He looks just like you," I exclaimed.

"He is, except each one of his fingers has a special significance. For example, if you want to add or subtract with a carry or if you want to mutiply or divide, he holds any number that is shifted off the end of our hands in his carry finger, the fourth finger of his left hand. If you want to use decimal representation while doing calculations he holds up the first finger of his left hand. He enables you to make all sorts of decisions in your program by holding up the fourth finger in his right hand when a number is negative, and the third finger in his left hand when a number is zero. You should get to know him well. He is very important.

"Another special location is 0100 to 0200 hex drive," he continued. "This is where the stack men are located. They go to work when we use the JSR express. They save the address we want to come back to.

"Here is an article we just put out. It is to let you know how lucky you are to know us. It is called 'Why is BASIC so Slow?' It explains the difference between an interpreter, which executes commands immediately without changing them to machine language; pseudo-compilers, which translate the high-level language into a pseudo code closer to machine language; and compilers, which translate ASCII text into machine code. But if you know us you don't have to worry about that stuff."

Soon we came upon a vast meadow where there was a long row of houses. The houses closest to us were red, then there were some blue houses, then some green houses, then some clear houses and farthest away were the yellow houses. All of a sudden all the houses turned clear. Then the

ten houses closest to us turned red and a small purple creature that resembled a penguin ran out of the first house and attached a chain from the first house to the second clear house.

I asked, "What's going on?"

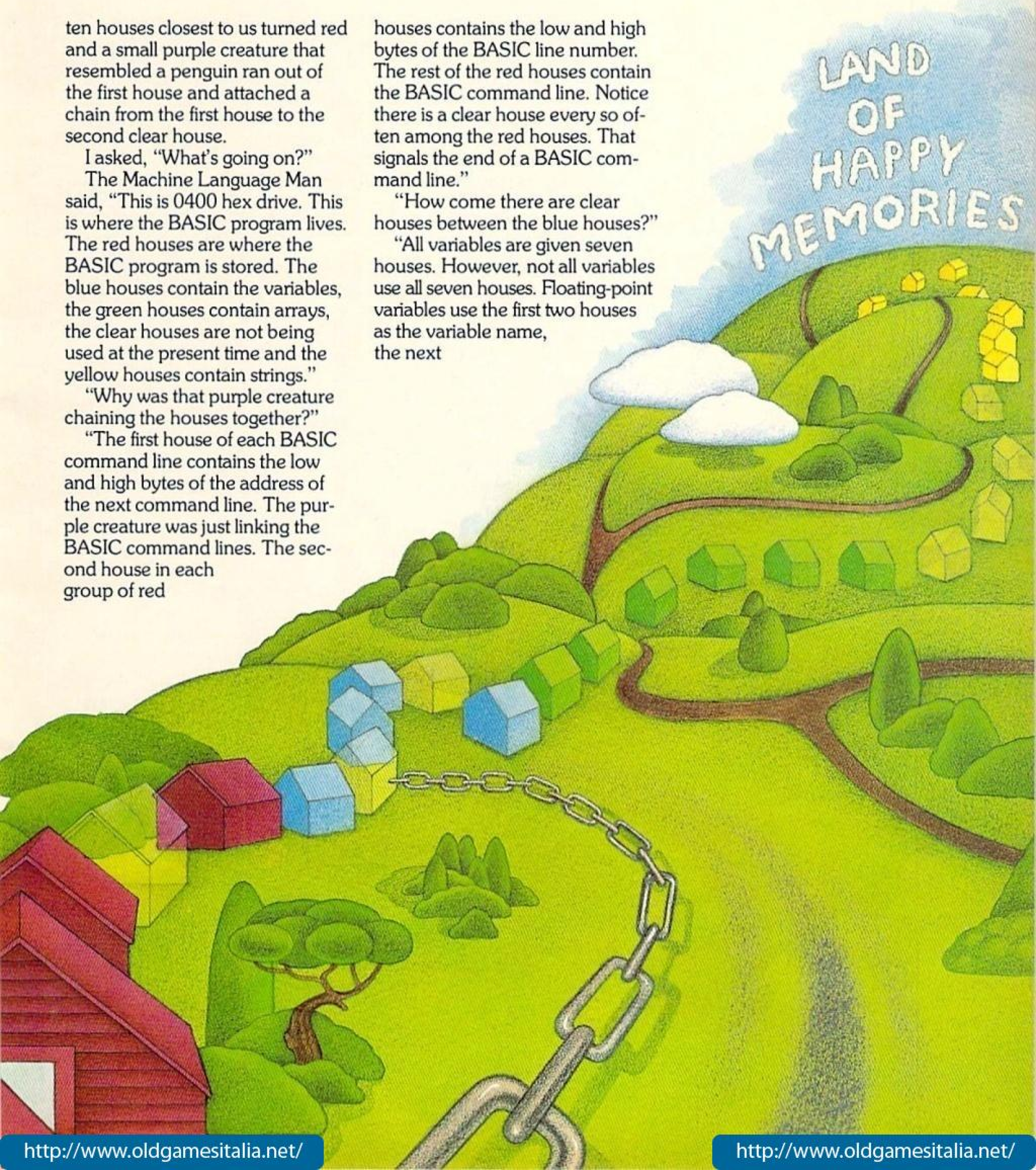
The Machine Language Man said, "This is 0400 hex drive. This is where the BASIC program lives. The red houses are where the BASIC program is stored. The blue houses contain the variables, the green houses contain arrays, the clear houses are not being used at the present time and the yellow houses contain strings."

"Why was that purple creature chaining the houses together?"

"The first house of each BASIC command line contains the low and high bytes of the address of the next command line. The purple creature was just linking the BASIC command lines. The second house in each group of red houses contains the low and high bytes of the BASIC line number. The rest of the red houses contain the BASIC command line. Notice there is a clear house every so often among the red houses. That signals the end of a BASIC command line."

"How come there are clear houses between the blue houses?"

"All variables are given seven houses. However, not all variables use all seven houses. Floating-point variables use the first two houses as the variable name, the next



> *All of a sudden I heard a loud voice say, "What's this garbage on the printer!" So I decided maybe I should try something more fundamental.*

house as the exponent and the last four houses as the mantissa.

"String variables use the first two houses as the variable name; the third house is the length of the string and the fourth and fifth houses are low and high bytes of the pointer to the string, as you can tell by the chain running from those houses to the yellow houses at the top of the Land of Happy Memories. String variables use only five houses. That leaves two clear houses.

"Integer variables use the first two houses as the variable name. The next two houses contain the high byte and the low byte of the integer. That leaves three clear houses.

"Arrays are in the green houses. They use the first two houses as the array name, the third and fourth houses as low and high byte of the offset, the fifth house as the number of dimensions, the next n times two houses as the high and low bytes of the dimension plus one and the rest of the houses contain the array."

I escaped from the Machine Language Man's lecture just before he started explaining three- and four-dimensional arrays. I found an article on "Mass Memory Now and in the Future" on the ground. I was almost afraid to pick it up after my experience in the Land of Happy Memories, but I'm a glutton for punishment.

As I read about the floppies, microfloppies and minimicrofloppies I noticed I was shrinking. Everything looked very different from this small perspective. I was in a land where there were miles and miles of wire fences. These fences had lots of gates in them. The gates had names on them like AND, OR, NAND and NOR.

There were cubes and spheres lying all over the ground, also. I picked up a cube and sent it down a wire that was marked REN. Cubes started coming back to me on a wire marked NRFD, so I sent some spheres and cubes on a wire marked DATA and then I sent some spheres on a wire marked DAV. I got some spheres back on the wire marked NRFD. Then I got some cubes back on a wire labeled NDAC.

All of a sudden I heard a loud voice say, "What's this garbage on the printer!" So I decided maybe I should try something more fundamental.

I went over to a gate that said OR. I put a sphere on one wire of the gate, and a cube on the other wire and a cube came out the other end. I decided to try this same thing with an AND gate and I got a sphere back. I thought, "This is interesting."

I put the sphere and the cube on the NOR gate and I got a sphere. But when I put them on the NAND gate I got a cube. I starting experimenting then. I built an inverter first, then a flip flop and then a half adder! Then I built a counter and wired it to some LED's so that when I put a binary number on the wires, the LED's formed the decimal equivalent. It was the most fun I had had on my trip so far.

I had really made a mess by moving all those gates around. In fact, I had fenced myself in so I started to look for a way out. While I was looking I found an article on the ground, so I sat down to read it. I was tired, after all, and I couldn't find a way out. I noticed as I read that I was shrinking again. I thought, "Oh no. When is this going to end."

When I finished the article I noticed a big sign above my head which said, "6502 Silicon Valley". I had shrunk down to a very minute size indeed. So I did some micro programming of my own. The instructions were, "Help! Get me out of here."

King Parentheses received my instructions and told me I had the power to leave all the time. All I had to do was click my heels three times and say, "There's no place like the Bronx."

Suddenly I appeared in the microcomputer lab. It was the end of the semester and the professor was saying, "For your final, write a summary of the course." So that night I started out writing…"I was walking by the microcomputer lab one sunny day…" C

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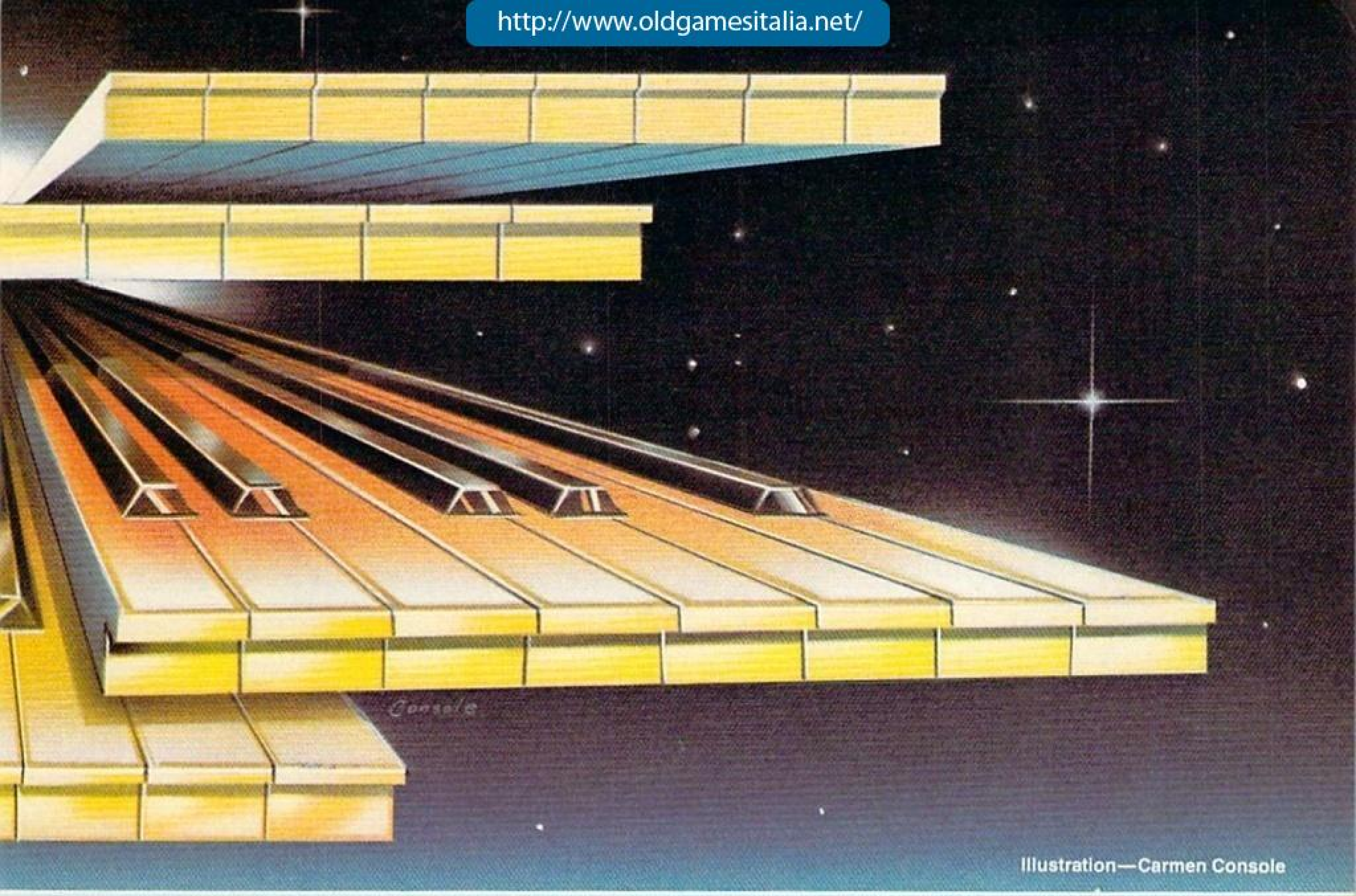
—. *MCS6500 Microcomputer Family Programming Manual*. (Norristown, Pennsylvania: MOS Technology, Inc.). C

SID PARAMETERS

So you thought you heard the last of the Commodore 64's Sound Interface Device (SID) when Paul Higginbottom wrapped up his year-long "Making Friends With SID" series, did you? Not quite. Here we have a method for streamlining data entry using the piano program that appeared in Part 3 of Paul's series (Summer, 1983).



Illustration—Carmen Console

SELECTION TABLE

By Joseph M. Humbert

I followed Paul Higginbottom's five-part series on the SID chip in *Power/Play* with great interest. (Winter, 1982 through Winter, 1983) I typed in the piano program from the third article and played with it for a while. But when it was time to experiment with different sounds, it quickly became apparent that the process of breaking into the program, changing the data statement, playing, breaking in again, changing, etc., could be streamlined.

What I came up with was a screen piano keyboard showing the keys that can be played. As each key is pressed the designation for that key on the screen blinks. Below this I placed a table showing the parameters for attack, decay, sustain, release, octave, voice, waveform and their range of values. Therefore, while you are playing, you can see all of these parameters at a glance, enabling you to see their correspondence to the sound being produced. Finally, the use of the function keys makes changing the value of these parameters very easy.

Under the weight of the added graphics, however, the music is sometimes slow to respond so that a fast playing of a song, for example, will put your fingers far ahead of the notes heard. But no matter; this modification was designed to show the relationship between the SID parameters and the sound they collectively produce.

Listed below are the program changes. Adding lines 1-99 will set up the screen keyboard and the selection table. It also provides the blinking to the key pressed. Lines 100 to 880 are Paul's original program with changes. And finally, lines 900-1830 provide the mechanism for changing the SID parameters on the selection table.

The modified program starts in the "play" mode with a piano sound. Attack and sustain values are shown to be 1/16th of their true values. For example, an attack of five on the table is really 5 × 16 = 80. Furthermore, an attack of five and a decay of ten is an attack/decay value of 90, which is a POKEd attack/decay address of 54277. Similarly for sustain and release.

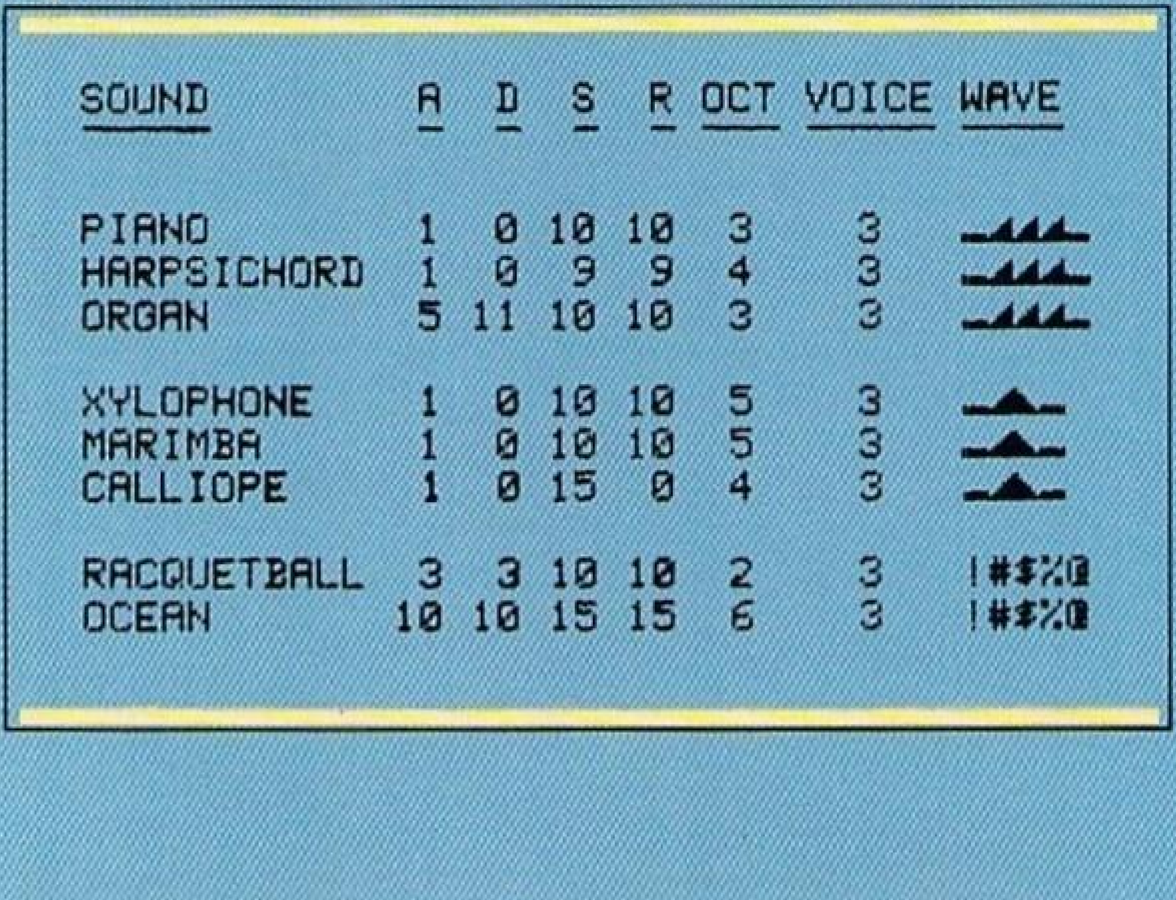
There are six octaves to choose from (one being the lowest frequencies) as well as one, two or three voices to choose from (one being monophonic). The waveforms are shown as pictures rather than numbers. They go in order of triangle, sawtooth, pulse (with pulsewidth value—which can be changed in line 510) and noise (not musical but great for sound effects). Three prompts between the screen keyboard and the selection table guide you in changing the SID values.

Essentially, to get into the "change parameters" mode, hit [SHIFT] and £ together. Hit function keys F1 to F6 to change the particular parameter associated with that key. A small tone will be heard. Hit that function key again to increase the value of the parameter. All parameters will cycle; that is, when they reach the maximum value they will start over at the minimum value. With that parameter changed, hit either [RETURN] to play or another function key to change another parameter.

Some of the sounds produced for various SID values are listed in Figure 1. You will undoubtedly discover a lot more. Let me know what you find. The last one is fun—you can actually "play" the ocean—nice for relaxing after a hard day at the keyboard.

The program changes require a bit of typing. You may wish to get a copy of the program by sending a blank cassette, a self-addressed, stamped mailer and $5.00 to me, Joe Humbert, SID Table, 7001 Sunkist Drive, Oakland CA 94605. **C**

Figure 1.



```
SOUND         A  D  S  R OCT VOICE WAVE

PIANO         1  0 10 10  3    3   ◢◢◢
HARPSICHORD   1  0  9  9  4    3   ◢◢◢
ORGAN         5 11 10 10  3    3   ◢◢◢

XYLOPHONE     1  0 10 10  5    3   ▲
MARIMBA       1  0 10 10  5    3   ▲
CALLIOPE      1  0 15  0  4    3   ▲

RACQUETBALL   3  3 10 10  2    3   !#$%@
OCEAN        10 10 15 15  6    3   !#$%@
```

SID Parameters Selection Table

```
1 REM A,D,S,R,OCT,VOICE,
  WAVE SELECTION  PROGRAM ADDED
  TO SID PIANO PROGRAM BY
2 REM PAUL HIGGINBOTTOM,
   AS MODIFIED BY JOSEPH M. HUMB
  ERT 1983
5 P1=1068:P2=1347:AC=54272:BP=1
  :SS=1:DIM Q(22)
7 POKE 53281,1:PRINT CHR$(8)
  :GOSUB 20:GOTO 100
9 REM ...PRINT SCREEN KEYBOARD
10 PRINT"[CLEAR,DOWN,SPACE2,
   BLACK,SHFT B] [RVS]2 [RVOFF]
   [RVS]3 [RVOFF] [SHFT B] [RVS]
   5 [RVOFF] [RVS]6 [RVOFF] [RVS]
   7 [RVOFF] [SHFT B]"
11 FOR KI=1 TO 4:PRINT"[SPACE2,
   BLACK,SHFT B] [RVS,SPACE2,
   RVOFF] [RVS,SPACE2,RVOFF]
   [SHFT B] [RVS,SPACE2,RVOFF]
   [RVS,SPACE2,RVOFF] [RVS,
   SPACE2,RVOFF] [SHFT B]":NEXT
12 FOR KI=1 TO 2:PRINT"[SPACE2,
   SHFT B,SPACE2,CMDR G,SPACE2,
   CMDR G] [SHFT B,SPACE2,CMDR G,
   SPACE2,CMDR G,SPACE2,CMDR G]
   [SHFT B]":NEXT
13 PRINT"[SPACE2,SHFT B]Q
   [CMDR G]W [CMDR G]E[SHFT B]R
   [CMDR G]T [CMDR G]Y [CMDR G]U
   [SHFT B]"
14 PRINT"[UP9]":PRINT TAB(22)"
   [BLACK,RVS]9 [RVOFF] [RVS]0
   [RVOFF] [SHFT B] [RVS]-
   [RVOFF] [RVS,POUND] [RVOFF]
   [SHFT B]"
15 FOR KI=1 TO 4:PRINT TAB(22)"
   [BLACK,RVS,SPACE2,RVOFF] [RVS,
   SPACE2,RVOFF] [SHFT B] [RVS,
   SPACE2,RVOFF] [RVS,SPACE2,
   RVOFF] [SHFT B]":NEXT
16 FOR KI=1 TO 2:PRINT TAB(22)"
   [SPACE2,CMDR G,SPACE2,CMDR G]
    [SHFT B,SPACE2,CMDR G,SPACE2,
   CMDR G] [SHFT B]":NEXT
17 PRINT TAB(22)"I [CMDR G]O
   [CMDR G]P[SHFT B]@ [CMDR G]*
   [CMDR G]^[SHFT B]"
18 PRINT"[SPACE2,CMDR Y36]"
   :PRINT"[L. BLUE]":RETURN
19 REM ...PRINT KEY PRESSED ON S
   CREEN KEYBOARD
20 Q(0)=P2:Q(1)=P1:Q(2)=1350
   :Q(3)=1071
25 Q(4)=1353:Q(5)=1355:Q(6)=1076
   :Q(7)=1358:Q(8)=1079
30 Q(9)=1361:Q(10)=1082
   :Q(11)=1364:Q(12)=1366
35 Q(13)=1087:Q(14)=1369
   :Q(15)=1090:Q(16)=1372
40 Q(17)=1374:Q(18)=1095
   :Q(19)=1377:Q(20)=1098
   :Q(21)=1380:RETURN
50 POKE Q(KEY),PEEK(Q(KEY))-128*
   SGN(PEEK(Q(KEY))-127)
   :POKE Q(KEY)+AC,0:RETURN
60 REM ...PRINT SELECTION TABLE
61 PRINT"[GRAY3] 0 1 2 3 4 5 6 7
    8 9 10 11 12 13 14 15[UP]"
   :RETURN
62 PRINT"[DOWN2,BLACK]
   F1 ATTACK (X16)":GOSUB 61:DV=A
   :PRINT"[UP,BLUE]":GOSUB 1100
64 PRINT"[BLACK]F3 DECAY"
   :GOSUB 61:DV=D:PRINT"[UP,BLUE]
   ":GOSUB 1100
66 PRINT"[BLACK]F5 SUSTAIN (X16)"
   :GOSUB 61:DV=S:PRINT"[UP,BLUE]
   ":GOSUB 1100
68 PRINT"[BLACK]F7 RELEASE"
   :GOSUB 61:DV=R:PRINT"[UP,BLUE]
   ":GOSUB 1100
70 PRINT"[BLACK]F2 OCTAVE[SPACE4,
   GRAY3]1 2 3 4 5 6":AV=OCT
   :PRINT"[UP2,BLUE]":GOSUB 1500
72 PRINT"[BLACK]F4 # VOICES
   [SPACE2,GRAY3]1 2 3":AV=VN+1
   :PRINT"[UP2,BLUE]":GOSUB 1500
74 PRINT"[BLACK]F6 WAVEFORM"
   :AV=WAVE/16:PRINT"[UP2,BLUE]"
   :GOSUB 1800
75 PRINT"[HOME,DOWN10,RVS,RED]
   PLAY KEYBOARD[SPACE28]";
76 PRINT"HIT 'SHIFT [POUND]
   ' TO CHANGE SID VALUES[SPACE5,
   RVOFF]";:RETURN
89 REM .....
90 GET A$:IF A$=""THEN 90
91 IF BP=0 THEN 94
92 POKE SID+1,20:POKE SID+5,0
   :POKE SID+6,249:POKE SID+4,17
   :POKE SID+4,16
94 RETURN
95 FOR I=0 TO 2:INDEX=SID+I*VM
```

```
96 POKE INDEX+5,A*16+D
97 POKE INDEX+6,S*16+R
98 POKE INDEX+2,PW AND 255:NEXT
   :RETURN
99 REM ...START OF ORIGINAL PROG
   RAM
100 FR=3520:REM NOTE 'A' IN TOP
    OCTAVE
110 CO=2^(1/12):REM CONSTANT MUL
    TIPLIER FOR NEXT SEMITONE
120 FOR I=1 TO 9:FR=FR/CO:NEXT
    :REM START FR AT 'C' BY GOIN
    G BACK 9 SEMITONES
130 SS=16777216:REM SID CLOCK
140 CS=1022730:REM CPU CLOCK
150 FC=SS/CS:REM FREQUENCY MULTI
    PLYING   CONSTANT
200 DIM F(7,11):REM FREQUENCY AR
    RAY       (OCTAVE,SEMITONE)
300 FOR I=0 TO 11:REM CYCLE THRO
    UGH 12      SEMITONES
310 S=FR*FC:REM CALCULATE SID VA
    LUE OF   SEMI TONE IN TOP OC
    TAVE
400 FOR J=7 TO 0 STEP-1:F(J,I)=S
    :S=S/2
410 NEXT: REM CALULATE VALUE FOR
     ALL 8   OCTAVES
420 FR=FR*CO:REM GO ONTO NEXT SE
    MITONE
430 NEXT: REM CONTINUE THROUGH A
    LL 12    SEMITONES
500 SID=54272
505 A=1:D=0:S=10:R=10
510 OCT=3:WAVE=32:VOICE=0:PW=200
520 VM=7:HI=256:VN=2
530 FOR I=0 TO 23:POKE SID+I,0
    :NEXT
540 POKE SID+24,15
560 GOSUB 95
686 POKE INDEX+3,PW/HI
700 K$="Q2W3ER5T6Y7UI9O0P@-*
    [POUND]^"
710 DIM K(255)
720 FOR I=1 TO LEN(K$)
730 K(ASC(MID$(K$,I,1)))=I
740 NEXT
750 GOSUB 9:GOSUB 62
800 BP=0:GOSUB 90:BP=1
808 IF A$="[SHFT POUND]
    "THEN GOTO 900
```

```
810 KEY=K(ASC(A$))-1
    :IF KEY<0 GOTO 800
816 GOSUB 50
820 IF KEY>11 THEN FRQ=F(OCT+1,
    KEY-12):GOTO 835
830 FRQ=F(OCT,KEY)
835 FH=INT(FRQ/HI):FL=FRQ-FH*HI
840 INDEX=SID+VOICE*VM
850 POKE INDEX,FL:POKE INDEX+1,FH
860 POKE INDEX+4,WAVE+1
    :FOR I=1 TO 50*A:NEXT
    :POKE INDEX+4,WAVE
865 GOSUB 50
870 VOICE=VOICE+1:IF VOICE>VN TH
    EN VOICE=0
880 GOTO 800
900 REM ...SELECTS FUNCTION KEYS
    /RETURN TO PLAY
901 PRINT"[HOME,DOWN10,RVS,BLUE]
    SELECT FUNCTION KEY[SPACE21,
    RVOFF]";
902 PRINT"[SPACE40]";
903 GOSUB 90:IF ASC(A$)>139 OR A
    SC(A$)<133 THEN 900
905 PRINT"[UP2,RVS,GREEN]
    HIT FUNCTION KEY FOR NEW PAR
    AMETER--HIT "
906 PRINT"[UP,RVS] NEW FUNCTION
    KEY, OR 'RETURN' TO PLAY
    [SPACE2]";
910 IF A$=CHR$(133)THEN PRINT"
    [DOWN,RVS,ORANGE]F1[RVOFF,
    BLUE,DOWN]":DV=A:GOSUB 1000
    :A=DV:GOTO 980
920 IF A$=CHR$(134)THEN PRINT"
    [DOWN3,RVS,ORANGE]F3[RVOFF,
    BLUE,DOWN]":DV=D:GOSUB 1000
    :D=DV:GOTO 980
930 IF A$=CHR$(135)THEN PRINT"
    [DOWN5,RVS,ORANGE]F5[RVOFF,
    BLUE,DOWN]":DV=S:GOSUB 1000
    :S=DV:GOTO 980
940 IF A$=CHR$(136)THEN PRINT"
    [DOWN7,RVS,ORANGE]F7[RVOFF,
    BLUE,DOWN]":DV=R:GOSUB 1000
    :R=DV:GOTO 980
950 IF A$=CHR$(137)THEN GOSUB 990
    :AV=OCT:NX=6:GOSUB 1400
    :OCT=AV:GOTO 980
960 IF A$=CHR$(138)THEN GOSUB 992
    :AV=VN+1:NX=3:GOSUB 1400
```

```
     :VN=AV-1:GOTO 980
970 IF A$=CHR$(139)THEN GOSUB 994
     :AV=WAVE/16:GOSUB 1700
     :WAVE=16*AV
980 IF B$=CHR$(13)THEN GOSUB 95
     :GOSUB 75:GOTO 810
985 PRINT"[HOME,DOWN10]":GOTO 903
990 PRINT"[DOWN9,ORANGE,RVS]F2
     [RVOFF,BLUE,UP]":RETURN
992 PRINT"[DOWN10,ORANGE,RVS]F4
     [RVOFF,BLUE,UP]":RETURN
994 PRINT"[DOWN11,ORANGE,RVS]F6
     [RVOFF,BLUE,UP]":RETURN
1000 REM ...SELECTS A,D,S,
      R PARAMETERS
1001 GET B$:IF B$=""THEN 1001
1003 IF B$<>A$THEN GOSUB 1300
      :RETURN
1005 DV=DV+1:IF DV>15 THEN DV=0
1010 PRINT"[UP2]":GOSUB 1100
      :GOSUB 1200:GOTO 1000
1100 REM ...PRINTS A,D,S,
      R PARAMETERS
1101 IF DV<10 THEN LL=2*DV
      :GOTO 1109
1108 LL=3*DV-9
1109 A1=DV:IF DV>9 THEN A1=A1-10
1120 PRINT TAB(LL+1)CHR$(18)CHR$
      (48+A1)
1125 IF DV>9 THEN PRINT"[UP]
      "TAB(LL)CHR$(18)CHR$(49)
1130 RETURN
1200 REM ...ERASES OLD A,D,S,
      R PARAMETERS
1201 PRINT"[GRAY3,UP3]"
      :IF DV=0 THEN PRINT"[DOWN]
      "TAB(36)CHR$(49)CHR$(53)
      :GOTO 1250
1205 IF DV=10 THEN PRINT"[DOWN]
      "TAB(19)CHR$(57):GOTO 1250
1210 IF DV<10 THEN PRINT"[DOWN]
      "TAB(LL-1)CHR$(48+DV-1)
      :GOTO 1250
1215 A3=DV:A3=A3-10
      :PRINT"[DOWN]"TAB(LL-3)CHR$
      (49)
1220 PRINT"[UP]"TAB(LL-2)CHR$(48
      +A3-1)
1250 PRINT"[UP,BLUE]":RETURN
1300 REM ...RETURNS F1-F6 TO ORI
      GINAL COLOR
1301 PRINT"[HOME,DOWN13,BLACK]F1"
      :PRINT:PRINT"F3":PRINT
      :PRINT"F5":PRINT:PRINT"F7"
1305 PRINT:PRINT"F2":PRINT"F4"
      :PRINT"F6":RETURN
1400 REM ...SELECTS OCT,
      VOICE PARAMETERS
1401 GET B$:IF B$=""THEN 1401
1403 IF B$<>A$THEN GOSUB 1300
      :RETURN
1407 AV=AV+1:IF AV>NX THEN AV=1
1440 GOSUB 1500:GOSUB 1600
      :GOTO 1400
1500 REM ...PRINTS OCT,
      VOICE PARAMETERS
1501 LL=11+2*AV
1510 PRINT TAB(LL)CHR$(18)CHR$(4
      8+AV)
1520 RETURN
1600 REM ...ERASES OLD OCT,
      VOICE PARAMETERS
1601 PRINT"[GRAY3,UP2]"
1610 IF AV=1 THEN PRINT TAB(11+2
      *NX)CHR$(48+NX)"[UP,BLUE]"
      :RETURN
1620 PRINT TAB(LL-2)CHR$(48+AV-1
      )"[UP,BLUE]"
1630 RETURN
1700 REM ...SELECTS WAVEFORM
1701 GET B$:IF B$=""THEN 1701
1705 IF B$<>A$THEN GOSUB 1300
      :RETURN
1710 SS=SS+1:IF SS>4 THEN SS=1
1715 AV=2^(SS-1)
1725 GOSUB 1800:GOTO 1700
1800 REM ...PRINTS PICTURE OF WA
      VEFORM
1801 IF AV=1 THEN PRINT TAB(14)"
      [CMDR P,RVS,SHFT POUND,
      CMDR *,RVOFF,CMDR P,SPACE10,
      UP] ":RETURN
1810 IF AV=2 THEN PRINT TAB(14)"
      [CMDR P,RVS,SHFT POUND3,
      RVOFF,CMDR P,SPACE8,UP,
      SPACE2]":RETURN
1820 IF AV=4 THEN PRINT TAB(14)"
      [CMDR P,RVS] [RVOFF,CMDR P,
      SPACE2,GRAY3]PW= ";PW
      :PRINT"[UP2,BLUE]":RETURN
1830 IF AV=8 THEN PRINT TAB(14)"
      !#$%@[SPACE8,UP]":RETURN
```

C

SE

Illustration—Robert Neumann

Composer

By Dennis Bloomfield

Everyone raves about the VIC 20 Super Expander's graphics capabilities, but you don't hear all that much about its marvelous music capabilities. Colorado music teacher/musician Dennis Bloomfield is about to remedy all that with this program that lets you create and save short to medium-length pieces of music using the super Super Expander.

The SE Composer is a utility program that provides easy editing and playback functions for composing music with the VIC 20 and the Super Expander cartridge. When you first run the program the VIC programmable function keys are defined. The F1 key will play your music, and the F8 key will call a subroutine that helps erase program lines. Key F3 actually performs two different jobs. When the program is halted and you are entering music, the F3 key will list all of the music statements from 100 to 1400. In the repeat mode, the F3 key will play your music without a screen display.

The program will ask if you would like to adjust the screen. If you do not care to adjust the screen, type N to continue. If you respond Y the cursor controls can be used to move the screen. When the screen is positioned where you want it, type D to continue.

After a title display you will have the option of either reading instructions on how to enter music data in the proper PRINT statement form or proceeding immediately to the composition of a tune. Should you choose to skip the instructions, the program will display a few tips on how to proceed and END the program so you can type PRINT statements containing your music. CAUTION: Do not use line numbers lower than 100 or higher than 1400 for the PRINT statements, as they can destroy parts of the main program.

If you are entering music and would like to hear it, press F1 to restart the program and play your tune. The SE Composer already contains a one-octave C scale (line 110 in the program listing), which is identical to the sample line displayed in the instruction section of the program and will be eliminated from memory when you type a new line 110 in your song.

After your song has been played the repeat menu will be displayed. If you press Y the music will play while it prints your music data on the screen. At the end of this playback the program will pause for a short time prior to returning to the repeat menu. You may freeze the screen display to examine the data by hitting the RUN/STOP key during this pause. After the pause you will be returned to the repeat menu. A choice of S or F3 from the repeat menu will blank the screen as it plays the tune and will return you to the repeat menu. Choosing N halts the program so you can continue entering music statements.

After you are satisfied with your composition, save the entire program if you want to keep your music and the SE Composer editing functions together in storage. I prefer to eliminate all of the program lines from 2 to 64 and from 1490 to 1696, however, which leaves only the music remaining. Hitting the F8 key will call a subroutine designed to help speed the line elimination process.

When you call the erasure routine you will be asked to input a starting line number. Input an even number, as the program lines are incremented by two in the SE Composer. The erasure routine will print 19 line numbers on the screen, starting with the line you picked, incremented by twos (Ex. 2-40). Hit the HOME key and then press the RETURN key on each line number you wish to eliminate from the program.

If the numbers to be printed for erasure fall within the reserved program lines (100 to 1400) you will be asked to make sure you have not made an error in your choice of lines to erase. A Y response will continue the process, while an N response will return you to the beginning of the erasure routine with no harm done.

If you should decide after calling this routine that you do not want to erase lines, RUN/STOP +RESTORE will get you out of the routine and not hurt your composition, although you may want to RUN the program from the beginning to re-center your screen (no data is lost with RUN because your music is actually part of the program). If you should decide to erase lines, be sure you do not erase your music (lines 100 to 1400). Also, be sure that you have saved a copy of the original SE Composer for future use!

The SE Composer program leaves just a little over 1100 bytes of memory free for your composition. While this is enough for music compositions of short to medium length, a very long piece could at some time need more memory. Since I use this program frequently and do not need the instruction portion of the program, I gained space by deleting the instructions. If you eliminate line 44 and line 1526 to and including line 1616, you can gain 2138 bytes of memory for use in composing. An additional 526 bytes can be obtained by removing REM statements. With the exception of line number 62, all REM statements can be eliminated from the program without affecting its operation. DO NOT remove line 62, however, since it is used by the editing features for repeating. I keep at least two different versions of the SE Composer on hand: a copy of the original and a copy with all the REM statements and instructions removed.

Explanation of Program Code

Line #	
12-16	Redefines the F1 and F3 function keys.
18	Branch to screen-centering subroutine.
22-32	Title Page display.
36-46	Instruction option menu.
50-58	Begin composing routine.
62	REM where repeats begin.
100-1400	Reserved program lines for actual composition data.
1492	Skip the "Freeze Display" Prompt.
1494-1496	Freeze the screen (halts the program with data shown).
1500-1524	Display the repeat menu.
1528-1616	Give the instructions for music data entry.
1620-1624	Pace the instructions with "Hit space bar" prompt.
1628-1656	Center the screen.
1660-1664	End the composition session.
1668	Print multiple cursor-down commands.
1672-1696	Line erasure routine.

You may have noticed that, although I have emphasized not using line numbers lower than 100 or higher than 1400 for music statements, you really could use numbers from 63 to 1491 without destroying essential SE Composer line numbers. I have left this "safety margin" in case you decide later to alter the beginning or end of your composition. I have used these lines in basically three ways: FOR-NEXT loops for repeating of songs, graphic routines to enhance the music and adding introductions and endings to songs.

The instructions given in the SE Composer program are explained in much greater detail in the manual that comes with your Super Expander cartridge. I strongly advise that you read it many times over. On page 15 of the manual, examples are given that show how to format your PRINT statements to play the same note in all three voices, a single melody in one voice, and simple chords using all three voices.

If music were written in just these three ways the examples provided would be all you need to know (and music would be very boring). Do you want two voices to play chords while the other voice plays a melody? What if you want all three voices to play their own independent melodies at the same time? Can the NOISE voice be used to play a drum beat behind the other three voices? The answers to all of these questions can be found in the manual (if you look hard enough).

For those of you who like to type in data, I have enclosed an example of music written with the Super Expander cartridge, using the SE Composer utility program. I hope this program will help you get many hours of enjoyment out of the music capabilities of your Super Expander cartridge. **C**

SE Composer

```
2 REM **SE COMPOSER**
4 REM **DENNIS      **
6 REM **BLOOMFIELD **
8 :
10 REM << DEFINE F KEYS >>
12 KEY 1,"[CLEAR]GOTO62"+CHR$(13)
14 KEY 3,"[CLEAR]LIST100-1400"+C
   HR$(13)
16 KEY 8,"[CLEAR]GOTO1672"+CHR$(
   13)
18 GOSUB 1628
20 REM << TITLE PAGE >>
22 POKE 36879,168
24 PRINT"[CLEAR,BLACK]":D=3
   :GOSUB 1668:PRINT"[SPACE4,RVS]
    SE COMPOSER[SPACE3]"
26 PRINT"[DOWN,SPACE9]FOR"
   :PRINT"[SPACE9]THE"
28 PRINT"[DOWN,SPACE4,RVS,SPACE4]
   VIC-20+[SPACE4,RVOFF,SPACE7,
   RVS] SUPER EXPANDER"
   :PRINT"[SPACE4,RVS,SPACE3]
   CARTRIDGE[SPACE3]"
30 PRINT"[DOWN] BY DENNIS BLOOMF
   IELD"
32 GOSUB 1620
34 REM << FIRST MENU >>
36 PRINT"[CLEAR]":D=4:GOSUB 1668
   :PRINT"[RED] [RVS]
   MAKE YOUR SELECTION
   :[RVOFF,BLACK]":X=0
38 PRINT"[DOWN2]1-READY TO COMPO
   SE":PRINT"[DOWN]
   2-DISPLAY INSTRUCTIONS"
40 GET A$:IF A$=""THEN 40
42 IF A$="1"THEN 50
44 IF A$="2"THEN 1528
46 IF A$<>"1"AND A$<>"2"THEN 40
48 REM << BEGIN COMPOSING >>
50 PRINT"[CLEAR,DOWN,SPACE2]
   READY TO COMPOSE?"
   :PRINT"[SPACE2]ENTER YOUR PRI
   NT[SPACE6]STATEMENTS!"
52 PRINT"[DOWN,SPACE6,RED,RVS]
   REMEMBER:[RVOFF,BLACK]"
   :PRINT"[DOWN]LINES 100 TO 140
   0 ARE":PRINT"RESERVED FOR MUS
   IC."
54 PRINT"[DOWN2]THESE KEYS WILL
   ASSISTYOU IN EDITING YOUR"
   :PRINT"PRINT STATEMENTS:"
56 PRINT"[DOWN,SPACE2,BLUE,RVS]
   KEY F1=RUN MUSIC "
   :PRINT"[SPACE2,RVS]
   KEY F3=LIST DATA [RVOFF,
   SPACE5,RVS]KEY F8=LINE ERASE
   [RVOFF,BLACK]"
58 PRINT"[DOWN2]";:END
60 :
62 REM << REPEATS START HERE ***
    DO NOT REMOVE *** PROGRAM WI
   LL CRASH >>
64 :
100 REM << FIRST LINE TO BE USED
      FOR MUSIC DATA >>
102 REM << SAMPLE MUSIC PRINT ST
    ATEMENT >>
110 PRINT"[CTRL-F]V9T6S2O2CDEFGA
    BO3C";
1400 REM << LAST LINE TO BE USED
      FOR MUSIC DATA >>
1490 REM << FREEZE SCREEN DATA >>
1492 IF X=0 THEN 1500
1494 D=6:GOSUB 1668
     :PRINT" HIT RUN/STOP TO SAV
     E":PRINT"[DOWN,SPACE4]
     SCREEN[SPACE2]DISPLAY"
1496 PRINT"[DOWN,SPACE6,RED,RVS]
     BE QUICK![RVOFF,BLACK]"
     :FOR W=1 TO 3000:NEXT
1498 REM << REPEAT MENU >>
1500 PRINT"[CLEAR]":D=3
     :GOSUB 1668:PRINT"[SPACE6,
     RED,RVS]RUN AGAIN?"
1502 PRINT"[DOWN3,BLACK,RVS]
     **********************";
1504 PRINT"[BLUE,SPACE24,RVOFF,
     BLACK]Y=RUN WITH DISPLAY
     [RVS,BLUE] ";
1506 PRINT"[RVS,SPACE5,RVOFF,
     BLACK]N=END PROGRAM[RVS,
     BLUE,SPACE5]";
1508 PRINT"[RVS,RVOFF,BLACK]
     S OR F3=RUN SOUND ONLY[RVS,
     BLUE]";:PRINT"[SPACE22]";
1510 PRINT"[BLACK]**************
     ********[RVOFF]"
1512 PRINT"[DOWN] MAKE YOUR SELE
     CTION"
1514 GET A$:IF A$=""THEN 1514
1516 IF A$=CHR$(89)THEN 1524
1518 IF A$=CHR$(83)THEN:X=0:PRINT"
     [CLEAR,CTRL-F]Q":GOTO 62
1520 IF A$=CHR$(78)THEN 1660
```

```
1522 IF A$<>CHR$(89)OR A$<>CHR$(
     78)THEN 1514
1524 PRINT"[CLEAR]"+CHR$(142)
     :PRINT"[CLEAR,CTRL-F]P"
     :X=X+1:GOTO 62
1526 REM << SE OPERATING INSTRUC
     TIONS >>
1528 PRINT"[CLEAR]"
     :FOR A=1 TO 300:NEXT
     :PRINT"[RED,SPACE5,RVS]
     INSTRUCTIONS[BLACK]"
     :POKE 36879,254
1530 PRINT"[DOWN2]IN ORDER TO CO
     MPOSE ON":PRINT"THE SUPER E
     XPANDER YOU"
1532 PRINT"MUST FIRST STOP THIS"
     :PRINT"[DOWN]PROGRAM RUNNIN
     G, AND":PRINT"[DOWN]
     THEN RESTART IT ";
1534 PRINT"AFTER":PRINT"[DOWN]
     HAVING INSERTED LINES"
     :PRINT"[DOWN]CONTAINING THE
      DATA"
1536 PRINT"[DOWN]FOR YOUR MUSIC."
1538 GOSUB 1620
1540 PRINT"[DOWN2]YOUR DATA IS T
     O BE IN":PRINT"[DOWN,RVS]
     PRINT STATEMENT FORM[RVOFF]"
     :PRINT"[DOWN]AND MAY BE ";
1542 PRINT"NUMBERED"
     :PRINT"[DOWN]FROM LINE 100
     TO LINE":PRINT"[DOWN]1400.";
     :PRINT"[SPACE2]BE CAREFUL,";
1544 PRINT" AS":PRINT"[DOWN]
     OTHER LINE NUMBERS CAN";
     :PRINT"[DOWN]DESTROY THE RE
     ST OF"
1546 PRINT"[DOWN]THE PROGRAM."
1548 GOSUB 1620
1550 PRINT"[UP,MAGENTA,RVS]
     SAMPLE PRINT STATEMENT
     [RVOFF,BLACK]";
1552 PRINT"110 PRINT'[RVS]F
     [RVOFF]V9T6S2O2CDEFGABO3C';"
     :PRINT"[MAGENTA,RVS,SPACE22]
     ";
1554 PRINT" [RVS]USE DOUBLE QUOT
     ES IN ";
1556 PRINT"[RVS,SPACE3]
     YOUR MUSIC PRINT[SPACE3]";
     :PRINT" [RVS,SPACE2]
     STATEMENTS !!!!![SPACE3]";
1558 PRINT"[RVS,SPACE22]"
     :PRINT"[RED,RVS]
     EXPLANATION OF SAMPLE
     :[RVS,BLACK]"
1560 PRINT"[DOWN]1-[RED,RVS]110
     [RVOFF,BLACK] IS THE LINE #
     .":PRINT"[DOWN]2-[RED,RVS]F
     [RVOFF,BLACK] IS OBTAINED B
     Y "
1562 PRINT"[SPACE2]HOLDING THE ";
1564 PRINT"CTRL KEY";
     :PRINT"[SPACE2]
     DOWN AND PRESSING(
     [BACK ARROW])"
     :PRINT"(THIS SETS MUSIC MOD
     E)"
1566 GOSUB 1620
1568 PRINT"[MAGENTA,RVS,SPACE7]
     (SAMPLE)[SPACE7,RVOFF,BLACK]
     ";
1570 PRINT"110 PRINT'[RVS]F
     [RVOFF]V9T6S2O2CDEFGABO3C';"
     :PRINT"[MAGENTA,RVS,SPACE22,
     RVOFF,BLACK]";
1572 PRINT"[DOWN]3-[RED,RVS]V9
     [RVOFF,BLACK] SETS THE VOLU
     ME."
1574 PRINT"[SPACE2]
     0 TO 9 CAN BE USED,"
     :PRINT"[SPACE2]
     9 IS LOUDEST."
     :PRINT"[DOWN]4-[RED,RVS]T6
     [RVOFF,BLACK] SETS THE NOTE"
1576 PRINT"[SPACE2]
     LENGTH. 0 TO 9 CAN"
     :PRINT"[SPACE2]BE USED,
      0 IS THE ":PRINT"[SPACE2]
     SHORTEST";
1578 PRINT" NOTE VALUE."
1580 PRINT"5-[RED,RVS]S2[RVOFF,
     BLACK] SETS THE VOICE."
     :PRINT"[DOWN,SPACE2]
     S1=TENOR[SPACE3]S2=ALTO"
     :PRINT"[SPACE2]S3=SOPRANO";
1582 PRINT" S4=NOISE":GOSUB 1620
1584 PRINT"[MAGENTA,RVS,SPACE7]
     (SAMPLE)[SPACE7,RVOFF,BLACK]";
1586 PRINT"110 PRINT'[RVS]F
     [RVOFF]V9T6S2O2CDEFGABO3C';"
1588 PRINT"[MAGENTA,RVS,SPACE22,
     RVOFF,BLACK]";
     :PRINT"6-[RED,RVS]O2[RVOFF,
     BLACK] SETS THE OCTAVE."
1590 PRINT"[SPACE2]
```

```
     1 TO 3 CAN BE USED,"
     :PRINT"[SPACE2]
     3 IS THE HIGHEST."
     :PRINT"[DOWN]7-[RED,RVS]
     CDEFGAB[RVOFF,BLACK]";
1592 PRINT" ARE THE"
1594 PRINT"[SPACE2]
     NOTES AVAILABLE IN"
     :PRINT"[SPACE2]
     EACH OCTAVE OF EACH"
     :PRINT"[SPACE2]VOICE."
1596 PRINT"[DOWN]8-THE (;
     ) AFTER THE":PRINT"[SPACE2]
     PRINT STATEMENT WILL";
1598 PRINT"[SPACE2]
     KEEP YOU IN THE"
1600 PRINT"[SPACE2]
     MUSIC MODE. WHEN YOU";
     :PRINT"[SPACE2]
     ARE DONE COMPOSING"
     :PRINT"[SPACE2]OMIT THE (;
     )."
1602 GOSUB 1620
1604 D=4:GOSUB 1668
     :PRINT"WHEN READY TO COMPOS
     E"
1606 PRINT"[SPACE3]
     RETURN TO START"
     :PRINT"[DOWN] [RVS,RED]
     PICK ONE:[RVOFF,BLACK]"
1608 PRINT"[DOWN] 1-REPEAT INSTR
     UCTIONS":PRINT" 2-RETURN TO
      START"
1610 GET A$:IF A$=""THEN 1610
1612 IF A$="1"THEN GOTO 1528
1614 IF A$="2"THEN POKE 36879,168
     :GOTO 36
1616 IF A$<>"1"AND A$<>"2"THEN 1
     610
1618 REM << SPACE BAR REQUEST >>
1620 PRINT"[DOWN,BLUE,SPACE4,RVS]
     HIT SPACE BAR [RVOFF,BLACK]"
1622 GET A$:IF A$=""THEN 1622
1624 PRINT"[CLEAR]"
     :FOR A=1 TO 400:NEXT:RETURN
1626 REM << SCREEN CENTER ROUTIN
     E >>
1628 POKE 36879,254
     :PRINT"[CLEAR,BLACK]"
1630 D=4:GOSUB 1668
     :PRINT"[SPACE2]
     ADJUST SCREEN? Y-N"
     :H=PEEK(36864):V=PEEK(36865)
```

```
1632 GET A$:IF A$=""THEN 1632
1634 IF A$="Y"THEN 1638
1636 IF A$="N"THEN POKE 36879,30
     :RETURN
1638 PRINT"[DOWN] USE THE CRSR K
     EYS TO"
1640 PRINT"[DOWN] MOVE SCREEN AN
     D THE"
1642 PRINT"[DOWN] LETTER D WHEN
     DONE."
1644 GET A$:IF A$=""THEN 1644
1646 IF A$="[UP]"THEN V=V-1
     :IF V<0 THEN V=0
1648 IF A$="[DOWN]"THEN V=V+1
     :IF V>40 THEN V=40
1650 IF A$="[LEFT]"THEN H=H-1
     :IF H<0 THEN H=0
1652 IF A$="[RIGHT]"THEN H=H+1
     :IF H>17 THEN H=17
1654 IF A$="D"THEN POKE 36879,30
     :RETURN
1656 POKE 36864,H:POKE 36865,V
     :GOTO 1644
1658 REM << FINAL PAGE >>
1660 PRINT"[CLEAR]":D=5
     :GOSUB 1668:PRINT"TO REPLAY
      YOUR MUSIC:":PRINT"[DOWN,
     SPACE7]PRESS F1"
1662 D=3:GOSUB 1668
     :PRINT"[SPACE2]
     TO LIST YOUR DATA:"
     :PRINT"[DOWN,SPACE7]
     PRESS F3"
1664 END
1666 REM << MULTIPLE CURSOR DOWN
      PRINTER >>
1668 FOR S=1 TO D:PRINT:NEXT:D=0
     :RETURN
1670 REM << LINE ERASER >>
1672 E1=0:POKE 36879,254
     :PRINT"[CLEAR,DOWN,BLACK]";
1674 PRINT"[SPACE5]LINE ERASER"
     :PRINT"[DOWN,RVS]
      USE RUN/STOP+RESTORE
     [SPACE7]TO ESCAPE[SPACE7]"
1676 PRINT"19 LINE NUMBERS WILL
     [SPACE2]BE DISPLAYED FOR EA
     CH ERASURE, INCREMENTED
     [SPACE2]BY 2'S."
1678 PRINT"WHEN LINE NUMBERS ARE
      PRINTED, MOVE CURSOR
     [SPACE2]TO THE UPPER LEFT
     [SPACE5]CORNER OF";
```

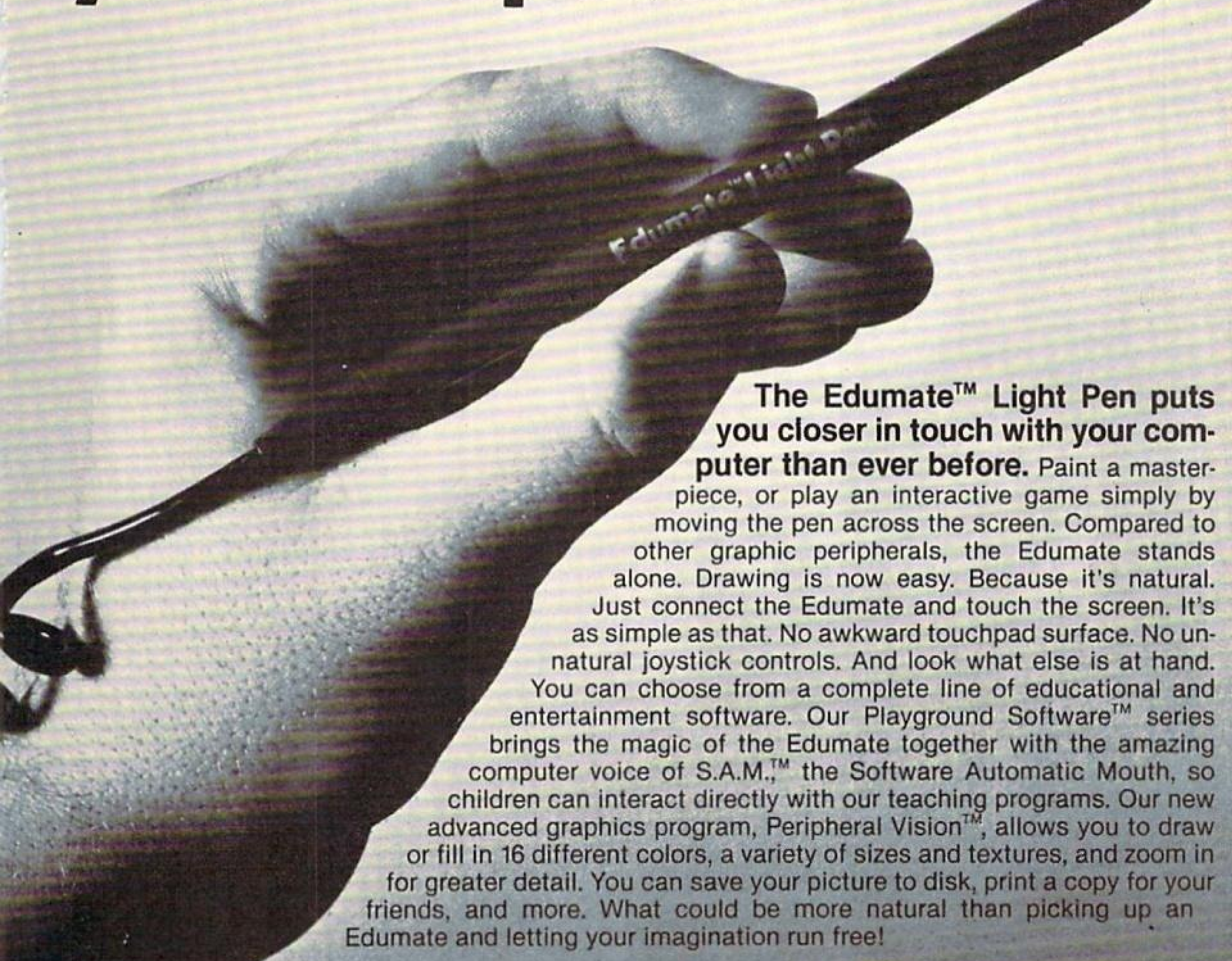
```
1680 PRINT" THE SCREEN[SPACE2]
     AND HIT RETURN ON EACHLINE
     NUMBER LISTED."
1682 PRINT"[DOWN,RVS]
     USE ONLY EVEN NUMBERS "
     :INPUT"[RVS]FIRST LINE TO G
     O";E1
1684 E2=E1+38:IF E2>=100 AND E1<
     =1400 THEN 1688
1686 PRINT"[CLEAR,BLACK]"
     :FOR E3=E1 TO E2 STEP 2
     :PRINT E3:NEXT:END
1688 PRINT"[DOWN,RED,RVS]
     ARE YOU SURE THIS WILLNOT D
     ESTROY MUSIC LINENUMBERS?
     [SPACE3](Y/N)[SPACE6]"
1690 GET A$:IF A$=""THEN 1690
1692 IF A$="Y"THEN 1686
1694 IF A$="N"THEN 1672
1696 IF A$<>"Y"OR A$<>"N"THEN 16
     90
```

Data for Sonatina #1 by Clementi

Use this data with your SE Composer to play a sample piece of music.

```
600 FOR G=1 TO 2
607 PRINT"[CTRL-F]T4V5S1O2CS3O2C
    T2ECT4S3O1GGT4S1O2RCS3O2CT2E
    CT4S3O1GT4O2G";
609 PRINT"S1O2RCT2S3O2FES3O2DCS1
    O2RT4S1O2CT2S3O1BO2CT2S3O1BO
    2C";
611 PRINT"T4S1O1GT2S3O2DCS3O1BAT
    4S3O1GT2S1O2GFED"
613 PRINT"[CTRL-F]T4V9S1O2CS3O2C
    T2ECT4S3O1GGT4S1O3RCS3O2ET2S
    3O2GET4CT4S1O2R#FT2S3O2EC";
615 PRINT"T4S1O2GT2S3O2DO1BT4S1O
    2CT2S2CO1AT4S1O2DT2S3O1BGT4S
    1O1DT2S3O1A#F";
617 PRINT"T4S1O1GT2S3O1GABO2CDE#
    FG"
619 PRINT"[CTRL-F]T4S3O1AT2S1O2#
    FO3DT4S3O2AT2S1O2AO3DT4S3O2A
    T2S1O2#FO3DT4S3O2AT2S1O2AO3D
    ";
621 PRINT"T4S1O2GT2S3O1BO2CDE#FG
    ABT4CT2S1O2AO3DT4S3O3CT2S1O3
    CDT4S3O3CT2S1O2AO3D";
623 PRINT"T4S3O3CT2S1O3CDT4S1O2B
    T2S3O2DGBO3DCO2BAG"
625 PRINT"[CTRL-F]T4S1O2CT2S3O2#
    FEG#FT4S1O2CT2S3O2AG#FET4S1O
    2DT2S3O2EDCO1BT4S1O1DT2S3O2D
    CO1BA";
627 PRINT"T6S3O1GT2S1O1BGO2DGT4O
    1GR"
628 NEXT
629 FOR G=1 TO 2
630 PRINT"[CTRL-F]T7S1O3FT4S3O1B
    T2O2DO1BT4GGT7S1O3$ET4S3O2CT
    2$ECT4O1GO2G";
632 PRINT"T6S1O2BT4S3O2FDT6S1O3C
    T4S3O2$ECT6S1O2GT2S3O1BO2CDO
    1BT4S3O1GG"
634 PRINT"[CTRL-F]T4S1O3FT2S3O2G
    O1GT4S1O2GT2S3O2GO1GT4S1O3DT
    2S3O2GO1GT4S1O2GT2S3O2GO1G";
636 PRINT"T4S1O3$ET2S3O2GO1GT4S1
    O2GT2S3O2GO1GT4S1O3CT2S3O2GO
    1GT4S1O2GT2S3O2GO1G";
638 PRINT"T4S1O2BT2S3O2D$EFDT4S1
    O3CT2S3O2F$EDCT4S1O2GS2O2BS3
    O2G";
640 PRINT"T4S1O1GT2S1O2GFEDT4CS2
    O2CT2ECT4O1GGT4S1O2RCS2O2CT2
    ECT4S2O1GO2G"
642 PRINT"[CTRL-F]T4S1O2CT2S2O2F
    EDCT4S1O2CT2S2O1BO2CO1BO2CT4
    S1O1GT2S2O2DCO1BAT4GT2S1O1GF
    EDT4C";
644 PRINT"S2O2CO1T2G2CT4EET4S1O2
    CS2O2ET2CET4GO3C";
646 PRINT"T4S1O2GS2O2ES3O1GT4S2O
    2DS3O1FT4S1O1GS2O2CS3O1ET4S2
    O1BS3O1D"
648 PRINT"[CTRL-F]T4S1O2CT2S3O1C
    DEFGABO2CT4S3O1DT2S1O1BO2GT4
    S3O2DT2S1O2DGT4S3O2DT2S1O1BO
    2G";
650 PRINT"T4S3O2DT2S1O2DGT4S1O2C
    T2S3O1EDFGBO2CDET4S3O1FT2S1O
    2DGT4S3O2FT2S1O2FG";
652 PRINT"T4S3O2FT2S1O2DGT4S3O2F
    T2S1O2FG";
654 PRINT"[CTRL-F]T4S1O2CT2S3O1G
    O2CEGFEDCT4S1O2FT2S3O2AGFET4
    S1O2FT2S3O2DCO1BA";
656 PRINT"T4S1O2GT2S3O1GAFGT4S1O
    1GT2S3O1EFDET6S3O1CT2S1O1CEG
    O2CO1T4CR"
658 NEXT
```

how to really get in touch with your computer.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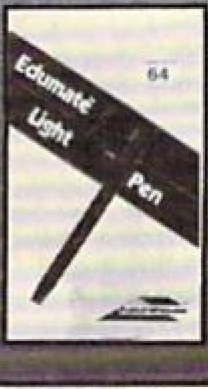
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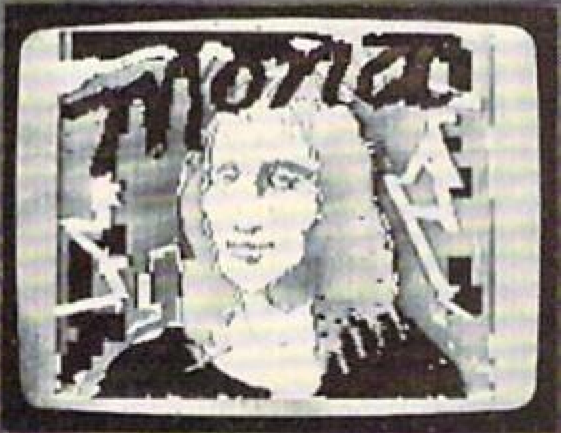

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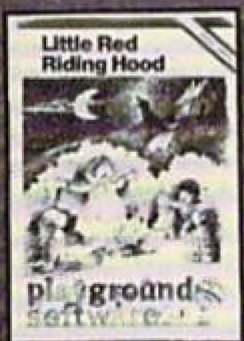
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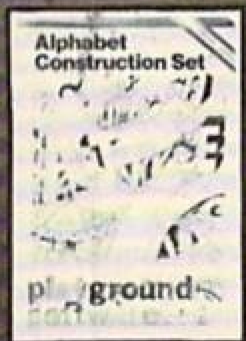
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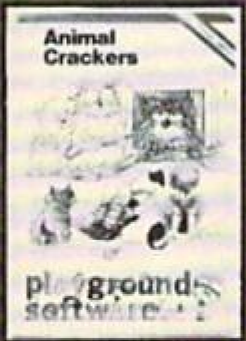
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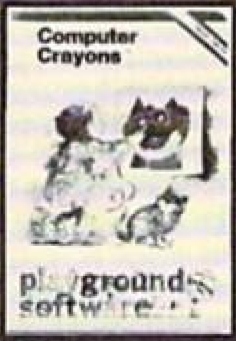
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(Continued from page 33)

```
28 DATA 3,76,204,255,32,3,9,162,
   -29
29 DATA 1,32,201,255,160,0,177,
   251,-49
30 DATA 32,210,255,230,251,208,2,
   230,-25
31 DATA 252,165,251,205,64,3,165,
   252,-61
32 DATA 237,65,3,144,231,169,55,
   133,-28
33 DATA 1,76,204,255,169,54,133,
   1,-61
34 DATA 169,9,133,252,169,84,133,
   251,-55
35 DATA 96,-28
200 DATA 36
210 M=63
220 READ X:L=PEEK(M):H=L=200
    :IF H THEN L=X
230 V=R<>L:S=(T<>63 AND R>0 AND
    V)
240 IF V THEN T=L:IF NOT S THEN
    R=R+1:S=R<>L
250 T=(T*3+X)AND 63
260 IF S THEN PRINT"ERROR LINE";R
    :E=-1
270 R=L:IF NOT H GOTO 220
280 IF E THEN STOP
290 X=-1:RESTORE:OPEN 1,8,3,"0
    :COPY FILE 64,P,W"
300 IF X>=0 THEN PRINT#1,CHR$(X);
310 READ X:L=PEEK(M)
    :IF L<200 GOTO 300
320 CLOSE 1:END
```

the commodore challenge

Congratulations to Commodore Challenge Contest Winner

Matt Cisternino of Ontario, California, for *Tunnel 2*

Thanks to all of you who submitted programs. They were all, as usual, great fun. (We never seem to have any problems getting volunteer judges for this department, for some reason.) And keep up the good work. Maybe next time the winner will be you.

The Commodore Challenge
Prizes • Prizes • Prizes

If you've been playing around at home developing original games and programs for your unexpanded VIC 20, send your best—on cassette or disk, please—to the Commodore Challenge contest. Include a brief description of the program's purpose, including documentation on how to use it. If it's a game, be sure to include instructions.

Programs requiring memory expansion are eligible, too, but will not be published unless space allows.

Winners will receive a VIC 20 8K Memory Expander Cartridge. All entries become the property of Commodore Business Machines, Inc., upon submission.

Fill out the entry form below, and submit it with your game or program to:

Commodore Business Machines, Inc.
1200 Wilson Drive
West Chester, PA 19380
Attn: POWER/PLAY

Commodore Challenge Contest . . . Entry Form

Name ______________________ Age __________ Phone ______________

Address ______________________ Program Title ______________

City ______________________ State __________ Zip ______________

I understand that my software entry becomes the property of Commodore Business Machines, Inc., upon submission.

Signature ______________________________________

Parent's signature, if contestant is minor ______________________

Void Where Prohibited

Tunnel 2

For Unexpanded VIC 20

by Matt Cisternino

Use the joystick to maneuver your ship and the fire button to shoot enemy ships. But you have to avoid hitting walls—and enemy ships—or you'll blow up. After two red and yellow zones you must destroy the enemy base by shooting through the enemy ships protecting it. The moving wall will always appear in your last position, so you have to keep moving. Shooting the enemy base awards 5000 points and an extra ship. Your score is displayed at the end of the game. **C**

Tunnel 2

```
1 PRINT"[CLEAR,WHITE]":POKE 36879,8:TU=0:F=7690:S=2
  :BU=7680:B5=32
2 DIM JS(2,2)
3 POKE 37139,0:DD=37154:PA=37137:PB=37152
5 SHIP=3
7 FOR I=0 TO 2:FOR J=0 TO 2:READ JS(J,I):NEXT J,I
10 GOTO 9000
20 GOTO 2000
100 DATA-23,-22,-21,-1,0,1,21,22,23
1000 A$="[RED,SPACE,RVS,SPACE10,RVOFF,SPACE9,RVS,SPACE,
     RVOFF]":RETURN
1010 A$="[RED,SPACE,RVS,SPACE,RVOFF,SPACE18,RVS,SPACE,
     RVOFF]":RETURN
1020 A$="[RED,SPACE,RVS,SPACE,RVOFF,SPACE9,RVS,SPACE10,
     RVOFF]":RETURN
2000 T=50:ED=1:IF TU=4 THEN 20000
2020 GOSUB 3000
2060 ON S GOSUB 1000,1010,1010,1010,1010,1010,1020,1010,
     1010,1010,1010,1010
2100 GOSUB 3500
2115 IF T<-10 THEN T=80:TU=TU+1:GOTO 6000
2120 GOTO 2020
3000 GOSUB 19000:IF JS(X+1,Y+1)=0 THEN AD=0
3010 IF JS(X+1,Y+1)THEN AD=JS(X+1,Y+1):POKE F,32
3012 IF FR AND ME2=0 THEN B5=46:ME2=1:POKE 36878,15
     :POKE 36877,240:POKE 36877,0:POKE 36878,16*S
3014 IF ME2=1 THEN GOSUB 12000
3016 IF ME2=0 THEN GOSUB 12022
3020 F=F+AD
3030 IF PEEK(F)=65 OR PEEK(F)=160 THEN GOTO 4000
3032 IF PEEK(8174)=102 THEN 3040
3035 IF PEEK(F+22)=65 THEN POKE F,32:F=F+22:GOTO 4000
```

```
3040 IF F<7680 THEN F=F+22
3050 IF F>8163 THEN F=F-22
3060 POKE 30720+F,14 AND 15:POKE F,88:POKE 36878,16*S
3070 RETURN
3500 POKE F,32:POKE BU,32:PRINT A$:POKE BU,B5
     :IF PEEK(F)=160 THEN 4000
3510 POKE 30720+F,14 AND 15:POKE F,88
     :REM POKE36878,16*INT(RND(1)*8)+7
3520 FOR D=1 TO T:NEXT:S=S+1
3530 IF S>12 THEN S=1:T=T-2
3540 RETURN
4000 POKE 36877,220:FOR ZZ=1 TO 100
4010 POKE 30720+F,10 AND 15:POKE 36878,16*6:POKE F,170
4020 POKE 36878,INT(15-ZZ/7):POKE F,128:NEXT:POKE 36877,0
4030 POKE 36878,15
4040 F=7690:SHIP=SHIP-1:IF SHIP=0 THEN 5000
4050 PRINT"[CLEAR]":ME2=0:BU=7680:B5=32
4060 ON ED GOTO 9080,9090
5000 POKE 36878,16*10:PRINT"[HOME,DOWN12,RIGHT6]GAME
     [SPACE]OVER"
5010 PRINT"[DOWN2,RIGHT5]SCORE:";SC
5020 GOSUB 19000:IF FR THEN RUN
5030 GOTO 5020
6000 T=50:ED=2
6020 GOSUB 3000
6060 ON S GOSUB 7000,7010,7010,7010,7010,7010,7020,7010,
     7010,7010,7010,7010
6100 GOSUB 3500
6115 IF T<-10 THEN T=80:TU=TU+1:GOTO 2000
6120 GOTO 6020
7000 A$="[YELLOW,SPACE,RVS,SPACE7,RVOFF,SPACE6,RVS,SPACE7,
     RVOFF]":RETURN
7010 A$="[YELLOW,SPACE,RVS,SPACE,RVOFF,SPACE18,RVS,SPACE,
     RVOFF]":RETURN
7020 A$="[YELLOW,SPACE,RVS,SPACE,RVOFF,SPACE6,RVS,SPACE6,
     RVOFF,SPACE6,RVS,SPACE,RVOFF]":RETURN
9000 PRINT"[DOWN2,SPACE6]'TUNNEL[SPACE]2'"
9010 PRINT"[DOWN,SPACE5]A[SPACE]PROGRAM[SPACE]BY"
9045 PRINT"[SPACE2]MATTHEW[SPACE]CISTERNINO"
9050 PRINT"[DOWN,SPACE]PRESS[SPACE]FIRE[SPACE]BUTTON
     [SPACE]TO[SPACE7]START[SPACE]GAME"
9060 GOSUB 19000:IF FR THEN 9070
9065 GOTO 9060
9070 T=50:ED=1:PRINT"[RED]"
```

```
9075 PRINT"[CLEAR]":POKE 38423,2:POKE 38442,2
     :POKE 7703,160:POKE 7722,160
9080 PRINT"[HOME,SPACE,RVS,SPACE,RVOFF]"SPC(18)"[RVS,
     SPACE,RVOFF]":GOTO 2100
9090 PRINT"[HOME,SPACE,RVS,SPACE,RVOFF]"SPC(18)"[RVS,
     SPACE,RVOFF]":GOTO 6100
12000 IF BU=7680 THEN BU=F:B5=46
12010 POKE BU,32:BU=BU+22
12016 IF PEEK(BU)=65 THEN Z7=0:GOTO 13000
12018 IF PEEK(BU+22)=65 THEN Z7=22:GOTO 13000
12020 IF PEEK(BU)=160 OR PEEK(BU+22)=160 OR BU>8185 THEN
      BU=7680:B5=32:ME2=0:RETURN
12022 IF PEEK(8143)<>160 THEN 12030
12024 EM=INT(RND(1)*18)
12026 IF PEEK(8144+EM)<>160 THEN POKE 38864+EM,11 AND 15
      :POKE 8144+EM,65
12030 IF PEEK(BU)=65 THEN Z7=0:GOTO 13000
12035 IF PEEK(BU)=102 OR PEEK(BU+22)=102 THEN GOTO 21000
12040 IF PEEK(BU+22)=65 THEN Z7=22:GOTO 13000
12050 POKE BU,B5:RETURN
13000 POKE BU+Z7,42:POKE 36878,15:POKE 36877,200
      :POKE 36878,16*S:FOR D=1 TO 15:NEXT
13010 POKE BU+Z7,32
13020 BU=7680:B5=32:ME2=0:SC=SC+100:RETURN
19000 POKE DD,127:S3=-((PEEK(PB)AND 128)=0):POKE DD,255
19010 P=PEEK(PA):S1=-((P AND 8)=0):S2=((P AND 16)=0)
      :SO=((P AND 4)=0)
19020 FR=-((P AND 32)=0):X=S2+S3:Y=SO+S1:RETURN
20000 PRINT"[CLEAR]":F=7910:WA=7680
20010 FOR D=7680 TO 8164 STEP 22:POKE D,160:POKE D+21,160
      :NEXT
20020 FOR E=1 TO 5:FOR D=1 TO 10:POKE 38779+D+(22*E),
      13 AND 15:POKE 8059+D+(22*E),65:NEXT D,E
20030 POKE 8174,102:POKE 8175,102
20040 POKE WA,160:WA=F
20050 GOSUB 3000
20060 GOTO 20040
21000 POKE 36878,15:POKE 36877,180:FOR X=1 TO 200
      :POKE 36879,127:POKE 36879,8:NEXT
21010 FOR X=15 TO 0 STEP-.125:POKE 36878,X:NEXT
21020 PRINT"[CLEAR]":SC=SC+5000:F=7690:SHIP=SHIP+1
      :GOTO 9075
```

high scores

In order to have your score published, send in a photo of the screen showing the score. If you're high, we'll run your name and score as soon as we can get it in.

VIC 20 Games

BLUE MEANIES	1,260 Alan S. Newman, Fairfield, CT
CAR CHASE	90,440 Alan Howard, Silver Lake, KS
CLOWNS	97,780 Jon Kirkbride, Cedars, PA
COSMIC CRUNCHER	995,000 Ralph E. Malerich, Boise, ID
DRAW POKER	17,410 R. Callia, Torrance, CA
GORF	333,510 Karl Goffinet, Terre Haute, IN
JUPITER LANDER	207,400 Christopher Champlain, St. Petersburg, FL
MIDNIGHT DRIVE	14.45 km Nathan Mehl, Newark, DE
MOLE ATTACK	427 Ryan Phillips, Montpelier, VT
MONEY WARS	69,140 Bob Grant, Bensalem, PA
OMEGA RACE	680,750 (5 ships) Tom Gazarek, North Baltimore, OH
PINBALL	1,500,000 Joe Ferrari, Commodore, Toronto
RADAR RAT RACE	147,240 Jennifer Zaruk, San Diego, CA
RAID ON FORT KNOX	4,454 Greg Ostrom, Saginaw, MI
SEA WOLF	29,500 Alieia Kondalski, Toledo, OH
SKY IS FALLING	22,080 Christina Zip, Perry, FL
SLITHER	261 Amy Miles, Mt. Pleasant, MI
SUPER ALIEN	45,700 Robert Schaeffer, Brookline, MA
SUPER SLITHER	203 Norbert Scheel, Mississauga, ONT
SUPER SLOT	9,675 coins Richard Woods, Woodbridge, NJ
SUPER SMASH	
VIC AVENGER	23,120 Nathan Brown, Newark, DE

Commodore 64 Games

CLOWNS	32,530 Duane Badman, Eleva, WI
KICKMAN	283,600 Stuart Pinho, Honolulu, HI
STARPOST	329,900 Carl Peterson, Poway, CA

If your score didn't set a record this time, keep playing! Maybe you'll topple these champion gamesters next time!

Announcement: We'd like to start running more high scores for Commodore 64 games, so if you think you have one send in a photo of the screen with your name and address on the back. Good luck, gamesters! C

access: commodore user groups

User Group Listing

ALABAMA

Huntsville PET Users Club
9002 Berclair Road
Huntsville, AL 35802
Contact: Hal Carey
Meetings: every 2nd
Thursday

Riverchase Commodore Users Group
617 Grove St.
Birmingham, AL 35209
(205) 988-1078
Ken Browning

Wiregrass Micro-Computer Society
Commodore SIG
109 Key Bend Rd.
Enterprise, AL 36330
(205) 347-7564
Bill Brown

Tiger Byte: E. Alabama CBM 64
Users Group
c/o The Computer Store, Inc.
Midway Plaza
Opelika, AL 36801
Jack Parsons
1st & 3rd Wed. of Month

The Birmingham Commodore
Computer Club
Birmingham, AL
(205) 923-9260
Harry Jones

Commodore Club of Mobile
3868-H Rue Maison
Mobile, AL 36608
(205) 343-1178
Tom Wyatt
3rd Thurs. of month

Shoals Commodore Users Group
(SCUG)
209 Lakeshore Dr.
Muscle Shoals, AL 35661
Geo. Taylor
2nd & 4th Tues. of month

ALASKA

COMPOOH-T
c/o Box 118
Old Harbor, AK 99643
(907) 286-2213

Alaska 84 Computer Club
c/o Line 49 Management
P.O. Box 6043
Anchorage, AK 99502

First City Users Group
P.O. Box 6692
Ketchikan, AK 99901
(907) 225-5695
James Llanos

ARIZONA

VIC Users Group
2612 E. Covina
Mesa, AZ 85203
Contact: Paul Muffuletto

Catalina Commodore Computer Club
2012 Avenida Guillermo
Tucson, AZ 85710
(602) 296-6766
George Pope
1st Tues. 7:30 p.m.

Central Arizona PET People
842 W. Calle del Norte
Chandler, AZ 85224
(602) 899-3622
Roy Schahrer

ACUG
c/o Home Computer Service
2028 W. Camelback Rd.
Phoenix, AZ 85015
(602) 249-1186
Dan Deacon
First Wed. of month

West Mesa VIC
2351 S. Standage
Mesa, AZ 85202
Kenneth S. Epstein

Arizona VIC 20-64 Users Club
232 W. 9th Place North
Mesa, AZ 85201
Donald Kipp

Arizona VIC & 64 Users
904 W. Marlboro Circle
Chandler, AZ 85224
(602) 963-6149
Tom Monson

ARKANSAS

Commodore/PET Users Club
Conway Middle School
Davis Street
Conway, AR 72032
Contact: Geneva Bowlin

Booneville 64 Club
c/o A. R. Hederich
Elementary School
401 W. 5th St.
Booneville, AR 72927
Mary Taff

The Siloam Commodore
Computer Club
P.O. Box 88
Siloam Springs, AR 72761
(501) 524-5624
Ken Emanualson

Russellville Commodore User Group
401 S. Arlington Dr.
Russellville, AR 72801
(501) 967-1868
Bob Brazeal

Arkansas River Valley
Commodore Users
401 S. Arlington Dr.
Russellville, AR 72801
(501) 967-1868
Bob Brazeal

CALIFORNIA

SCPUG Southern California
PET Users Group
c/o Data Equipment Supply
Corp.
8315 Firestone Blvd.
Downey, CA 90241
(213) 923-9361
Meetings: First Tuesday of
each month

California VIC Users Group
c/o Data Equipment Supply
Corp.
8315 Firestone Blvd.
Downey, CA 90241
(213) 923-9361
Meetings: Second Tues. of
each month

Valley Computer Club
1913 Booth Road
Ceres, CA 95307

PUG of Silicon Valley
22355 Rancho Ventura Road
Cupertino, CA 95014

Lincoln Computer Club
750 E. Yosemite
Manteca, CA 95336
John Fung, Advisor

PET on the Air
525 Crestlake Drive
San Francisco, CA 94132
Max J. Babin, Secretary

PALS (Pets Around)
Livermore Society
886 South K
Livermore, CA 94550
(415) 449-1084
Every third Wednesday
7:30 p.m.
Contact: J. Johnson

SPHINX
7615 Leviston Ave.
El Cerrito, CA 94530
(415) 527-9286
Bill MacCracken

San Diego PUG
c/o D. Costarakis
3562 Union Street
(714) 235-7626
7 a.m.-4 p.m.

Walnut Creek PET
Users Club
1815 Ygnacio Valley
Road
Walnut Creek, CA 94596

Jurupa Wizards
8700 Galena St.
Riverside, CA 92509
781-1731
Walter J. Scott

The Commodore Connection
2301 Mission St.
Santa Cruz, CA 95060
(408) 425-8054
Bud Massey

San Fernando Valley
Commodore Users Group
21208 Nashville
Chatsworth, CA 91311
(213) 709-4736
Tom Lynch
2nd Wed. 7:30

VACUUM
277 E. 10th Ave.
Chico, CA 95926
(916) 891-8085
Mike Casella
2nd Monday of month

VIC 20 Users Group
2791 McBride Ln. #121
Santa Rosa, CA
(707) 575-9836
Tyson Verse

South Bay Commodore Users Group
1402 W. 218th St.
Torrance, CA 90501
Contact: Earl Evans

Slo VIC 20/64 Computer Club
1766 9th St.
Los Osos, CA

The Diamond Bar R.O.P. Users Club
2644 Amelgado
Haciendo Hgts., CA 91745
(213) 333-2645
Don McIntosh

Commodore Interest Association
c/o Computer Data
14660 La Paz Dr.
Victorville, CA 92392
Mark Finley

Fairfield VIC 20 Club
1336 McKinley St.
Fairfield, CA 94533
(707) 427-0143
Al Brewer
1st & 3rd Tues. at 7 p.m.

Computer Barn Computer Club
319 Main St.
Suite #2
Salinas, CA 93901
757-0788
S. Mark Vanderbilt

Humboldt Commodore Group
P.O. Box 570
Arcata, CA 95521
R. Turner

Napa Valley Commodore
Computer Club
c/o Liberty Computerware
2680 Jefferson St.
Napa, CA 94558
(707) 252-6281
Mick Winter
1st & 3rd Mon. of month

S.D. East County C-64 User Group
6353 Lake Apopka Place
San Diego, CA 92119
(619) 698-7814
Linda Schwartz

Commodore Users Group
4237 Pulmeria Ct.
Santa Maria, CA 93455
(805) 937-4174
Gilbert Vela

Bay Area Home Computer Asso.
Walnut Creek Group
1332 Pine St.
Walnut Creek, CA 94598
(415) 932-5447
Cliff Downing

Amateurs and Artesians Computing
P.O. Box 682
Cobb, CA 95426

Manteca VIC 20 Users Organization
429 N. Main St.
Manteca, CA 95336
Gene Rong

Pomona Valley Vic Users Group
1401 W. 9th, #77
Pomona, CA 91766
(714) 620-8889
Mark Joerger
1st & 3rd Wed. of month 7 p.m.

VIC TORII-The VIC 20 Users Group
PSC #1, Box 23467
APO San Francisco, CA 96230
Wesley Clark

The Valley Computer Club
2006 Magnolia Blvd.
Burbank, CA 91506
1st Wed. 7 p.m.

The Commodore Tech. Users
of Orange Co.
P.O. Box 1497

Costa Mesa, CA 92626
(714) 731-5195
Roger Fisher

VIC 20 Software Exchange Club
10530 Sky Circle
Grass Valley, CA 95945
Daniel Upton

C-64 West Orange County
Users Group
P.O. Box 1457
Huntington Beach, CA 92647
(714) 842-4484
Philip Putman
2nd & 4th Tues. of month

Antelope Valley Commodore
Users Group
POB 4436
Lancaster, CA 93539
(805) 942-2626
James Haner
1st Saturday

Diablo Valley Commodore
Users Group
762 Ruth Dr.
Pleasant Hill, CA 94523
(415) 671-0145
Ben Braver
2nd & 4th Thurs. 7:30 p.m.

Commodore Connection
11652 Valverde Ave.
Riverside, CA 92505
(714) 689-7447
Tony Alvarez

CA. Area Commodore Terminal
Users Society
C.A.C.T.U.S.
P.O. Box 1277
Alta Loma, CA 91701
Darrell Hall

20/64
P.O. Box 18473
San Jose, CA 95158
(408) 978-0546
1st Sun. of month (6-9 p.m.)

8120 Sundance Dr.
Orangevale, CA 95662
(916) 969-2028
Robyn Graves

Software 64
353 California Dr.
Burlingame, CA 94010
(415) 340-7115
Mario Abad

Sacramento Commodore Users Group
8120 Sundance Dr.
Orangevale, CA 95662
(916) 969-2028
Robyn Graves

Peninsula Commodore Users Group
549 Old County Rd.
San Carlos, CA 94070
(415) 593-7697
Timothy Very
2nd Thurs. of Month

San Francisco Commodore
Users Group
278-27th Ave. #103
San Francisco, CA 94121
(415) 387-0225
Roger Tierce

South Bay Commodore 64
Users Group
P.O. Box 3193
San Ysidro, CA 95073

Commodore 64 West Computer Club
2917 Colorado Ave.
Santa Monica, CA 90404
(213) 828-9308
Don Campbell

Sixty Fourum
4413 E. Iowa
Fresno, CA 93702
(209) 252-0392
Deb Christensen

Marin Commodore Computer Club
620 Del Ganado Rd.
San Rafael, CA
(415) 479-0426
2nd Wed. of month 7:30 p.m.

COLORADO

VICKIMPET Users Group
4 Waring Lane, Greenwood
Village
Littleton, CO 80121
Contact: Louis Roehrs

Colorado Commodore
Computer Club
2187 S. Golden Ct.
Denver, CO 80227
986-0577
Jack Moss
Meet: 2nd Wed.

CONNECTICUT

John F. Garbarino
Skiff Lane Masons Island
Mystic, CT 06355
(203) 536-9789

Commodore User Club
Wethersfield High School
411 Wolcott Hill Road
Wethersfield, CT 06109
Contact: Daniel G. Spaneas

VIC Users Club
c/o Edward Barszczewski
22 Tunxis Road
West Hartford, CT 06107

New London County
Commodore Club
Doolittle Road
Preston, CT 06360
Contact: Dr. Walter Doolittle

The Commodore East Users Group
165 B S. Bigelow Rd.
Hampton, CT 06247
(203) 455-0108

DISTRICT OF COLUMBIA

USO Computer Club
USO Outreach Center
207 Beyer Rd., SW
Washington, DC 20332
Steven Guenther

FLORIDA

Jacksonville Area
PET Society
401 Monument Road, #177
Jacksonville, FL 32211

Richard Prestien
6278 SW 14th Street
Miami, FL 33144

South Florida
PET Users Group
Dave Young
7170 S.W. 11th
West Hollywood, FL 33023
(305) 987-6982

PETs and Friends
129 NE 44 St.
Miami, FL 33137
Richard Plumer

Sun Coast VICs
P.O. Box 1042
Indian Rocks Beach, FL
33535
Mark Weddell

Bay Commodore Users
Group
c/o Gulf Coast Computer
Exchange
241 N. Tyndall Pkwy.
P.O. Box 6215
Panama City, FL 32401
(904) 785-6441
Richard Scofield

Gainesville Commodore
Users Club
3604-20A SW 31st Dr.
Gainesville, FL 32608
Louis Wallace

Brandon Users Group
108 Anglewood Dr.
Brandon, FL 33511
(813) 685-5138
Paul Daugherty

Brandon Commodore Users Group
414 E. Lumsden Rd.
Brandon, FL 33511

Gainesville Commodore
Users Group
Santa Fe Community College
Gainesville, FL 32602
James E. Birdsell

Commodore Computer Club
P.O. Box 21138
St. Petersburg, FL 33742
(813) 522-2547
Chuck Fechko

Commodore Users Group
545 E. Park Ave.
Apt. #2
Tallahassee, FL 32301
(904) 224-6286
Jim Neill

The Commodore Connection
P.O. Box 6684
West Palm Beach, FL 33405

El Shift OH
P.O. Box 548
Cocoa, FL 32922
Mike Schnoke
Sat. mornings/every 4 to 6 weeks

Miami 20/64
12911 S.W. 49th St.
Miami, FL 33175
(305) 226-1185

Tampa Bay Commodore
Computer Club
10208 N. 30th St.
Tampa, FL 33612
(813) 977-0877

Commodore Computer Club
P.O. Box 9726
Jacksonville, FL 32208
(904) 764-5457
David Phillips
2nd & 4th Tues. of Month

VIC/64 Heartland Users Group
1220 Bartow Rd. #23
Lakeland, FL 33801
(813) 666-2132
Tom Keough
4th Wed. of Month at PRC

64 Educators Users Group South
FDLRS-South
9220 S.W. 52nd Terrace
Miami, FL 33165
(305) 274-3501
Dr. Eydie Sloane

64 Educators Users Group North
16330 N.E. 2nd Ave.
North Miami Beach, FL 33162
(305) 944-5548
Robert Figueroa

Suncoast 64S
c/o Little Professor Book Center
2395 U.S. 19 North
Palm Harbor, FL 33563
(813) 785-1036
Curtis Miller

Lakeland VIC 20 Users Group
2450 Shady Acres Dr.
Mulberry, FL 33860

Broward Commodore Users Group
13 Spinning Wheel Lane
Tamarac, FL 33319
(305) 726-4390
Lewis Horn

GEORGIA

VIC Educators Users Group
Cherokee County Schools
110 Academy St.
Canton, GA 30114
Dr. Al Evans

Bldg. 68, FLETC
Glynco, GA 31524
Richard L. Young

VIC-tims
P.O. Box 467052
Atlanta, GA 30346
(404) 922-7088
Eric Ellison

Golden Isles Commodore
Users Club
Bldg. 68, FLETC
Glynco, GA 31524
Richard L. Young

Commodore Club of Augusta
1011 River Ridge Rd.
Apt. #14-A
Augusta, GA 30909
David Dumas

Dataswapper Users Group
1794 Alabama Ave.
Albany, GA 31705
(912) 436-5596
David Via

HAWAII

Commodore Users Group of Honolulu
c/o PSH
824 Bannister St.
Honolulu, HI
(808) 848-2088
3rd Fri. every month

20/64 Hawaii
P.O. Box 966
Kailua, HI 96734
Wes Goodpaster

access:
commodore user groups

Commodore Users Group of Honolulu
1626 Wilder #701
Honolulu, HI 96822
(808) 848-2088
Jay Calvin (808) 944-9380

IDAHO

GHS Computer Club
c/o Grangeville High School
910 S. D St.
Grangeville, ID 83530
Don Kissinger

S.R.H.S. Computer Club
c/o Salmon River H.S.
Riggins, ID 83549
Barney Foster

Commodore Users
548 E. Center
Pocatello, ID 83201
(208) 233-0670
Leroy Jones

Eagle Rock Commodore Users Group
900 S. Emerson
Idaho Falls, ID 83401
Nancy J. Picker

64 Bug (Boise Users Group)
P.O. Box 276
Boise, ID 83701
(208) 344-6302
John Rosecrans

ILLINOIS

Shelly Wernikoff
2731 N. Milwaukee
Avenue
Chicago, IL 60647

VIC 20/64 Users Support
Group
c/o David R. Tarvin
114 S. Clark Street
Pana, IL 62557
(217) 562-4568

Central Illinois PET User
Group
635 Maple
Mt. Zion, IL 62549
(217) 864-5320
Contact: Jim Oldfield

ASM/TED User Group
200 S. Century
Rantoul, IL 61866
(217) 893-4577
Contact: Brant Anderson

PET VIC Club (PVC)
40 S. Lincoln
Mundelein, IL 60060
Contact: Paul Schmidt,
President

Rockford Area PET Users
Group
1608 Benton Street
Rockford, IL 61107

Commodore Users Club
1707 East Main St.
Olney, IL 62450
Contact: David E. Lawless

VIC Chicago Club
3822 N. Bell Ave.
Chicago, IL 60618
John L. Rosengarten

Chicago Commodore 64
Users & Exchange Group
P.O. Box 14233
Chicago, IL 60614
Jim Robinson

Fox Valley PET Users
Group
833 Willow St.
Lake in the Hills, IL 60102
(312) 658-7321
Art DeKneef

The Commodore 64 Users
Group
P.O. Box 572
Glen Ellyn, IL 60137
(312) 790-4320
Gus Pagnotta

RAP 64/VIC Regional
Assoc. of Programmers
10721 S. Lamon
Oak Lawn, IL 60453
Bob Hughes

The Kankakee Hackers
RR #1, Box 279
St. Anne, IL 60964
(815) 933-4407
Rich Westerman

WIPUG
Rt. 5, Box 75
Quincy, IL 62301
(217) 656-3671
Edward Mills

Papug-Peoria Area Pet Users Group
6 Apple Tree Lane
East Peoria, IL 61611
(309) 673-6635
Max Taylor
2nd Fri. of Month

McHenry County Commodore Club
4900 S. Route 31
Crystal Lake, IL 60014
(815) 455-3942
John Katkus
2nd Sat. of month 9 to 12 a.m.

INDIANA

PET/64 Users
10136 E. 96th St.
Indianapolis, IN 46256
(317) 842-6353
Jerry Brinson

Cardinal Sales
6225 Coffman Road
Indianapolis, IN 46268
(317) 298-9650
Contact: Carol Wheeler

CHUG (Commodore
Hardware Users Group)
12104 Meadow Lane
Oaklandon, IN 46236
Contact: Ted Powell

VIC Indy Club
P.O. Box 11543
Indianapolis, IN 46201
(317) 898-8023
Ken Ralston

Northern Indiana
Commodore Enthusiasts
927 S. 26th St.
South Bend, IN 46615
Eric R. Bean

Commodore Users Group
1020 Michigan Ave.
Logansport, IN 46947
(219) 722-5205
Mark Bender

Computer Workshop VIC 20/64 Club
282 S. 600 W.
Hebron, IN 46341
(219) 988-4535
Mary O'Bringer

The National Science Clubs
of America
Commodore Users Division
7704 Taft St.
Merrillville, IN 46410
Brian Lepley or Tom Vlasic

East Central Indiana VIC User Group
Rural Route #2
Portland, IN 47371
Stephen Erwin

National VIC 20 Program Exchange
102 Hickory Court
Portland, IN 47371
(219) 726-4202
Stephen Erwin

Commodore Computer Club
3814 Terra Trace
Evansville, IN 47711
(812) 477-0739
John Patrick, President

Commodore 64 Users Group
912 South Brown Ave.
Terre Haute, IN 47803
(812) 234-5099
Dennis Graham

Seymour Peekers
c/o D&L Camera Shop
108 N. Chestnut
Seymour, IN 47274
Dennis Peters

IOWA

Commodore User Group
114 8th St.
Ames, IA 50010

Quad City Commodore Club
1721 Grant St.
Bettendorf, IA 52722
(319) 355-2641
John Yigas

Siouxland Commodore Club
2700 Sheridan St.
Sioux City, IA 51104
(712) 258-7903
Gary Johnson
1st & 3rd Monday of month

421 W. 6th St.
Waterloo, IA 50702
(319) 232-1062
Frederick Volker

Commodore Computer Users
Group of Iowa
Box 3140
Des Moines, IA 50316
(515) 263-0963 or (515) 287-1378
Laura Miller

Commo-Hawk Commodore
Users Group
P.O. Box 2724
Cedar Rapids, IA 52406
Vern Rotert

KANSAS

Wichita Area PET
Users Group
2231 Bullinger
Wichita, KS 67204
(316) 838-0518
Contact: Mel Zandler

Kansas Commodore
Computer Club
101 S. Burch
Olathe, KS 66061
Contact: Paul B. Howard

Commodore Users Group
6050 S. 183 St. West
Viola, KS 67149
Walter Lounsbery

Walnut Valley Commodore
User Group
1003 S. 2nd St.
Arkansas City, KS 67005
Bob Morris

KENTUCKY

VIC Connection
1010 S. Elm
Henderson, KY 42420
Jim Kemp

Louisville Users of Commodore KY.
(LUCKY)
P.O. Box 22244
Louisville, KY 40222
(502) 425-2847
2nd Tues. of Month

The Bowling Green Commodore
Users Group
Route 11, Creekside Apt. #6
Bowling Green, KY 42101
(502) 781-9098
Alex Fitzpatrick

LOUISIANA

Franklin Parish Computer
Club
#3 Fair Ave.
Winnisboro, LA 71295
James D. Mays, Sr.

NOVA
917 Gordon St.
New Orleans, LA 70117
(504) 948-7643
Kenneth McGruder, Sr.

VIC 20 Users Group
5064 Bowdon St.
Marrero, LA 70072
(504) 341-5305
Wayne D. Lowery, R.N.

64-Club News
5551 Corporate Blvd.
Suite 3L
Baton Rouge, LA 70808
(504) 766-7408
Tom Parsons
3rd Tues. of month at CWA

Commodore Users Group of Oachita
P.O. Box 175
Swaric, LA 71281
(318) 343-8044
Beckie Walker

Ark-La-Tex Commodore 64 Club
198 India Dr.
Shreveport, LA 71115
(318) 797-9702
Pete Whaley

Commodore 64 Users Group
P.O. Box 1422
Baton Rouge, LA 70821
Richard Hood
3rd Tues. of month

MAINE

COM-VICS
(Commodore/VIC Users Group)
RFD #1, Box 2086
Hebron, ME 04238
(207) 966-3641
Paul Lodge
1st Wed. & 3rd Thurs.

Your Commodore Users Group
Box 611
Westbrook, ME 04092
(207) 854-4579
Mike Procise

MARYLAND

Assoc. of Personal
Computer Users
5014 Rodman Road
Bethesda, MD 20016

Blue TUSK
700 East Joppa Road
Baltimore, MD 21204
Contact: Jim Hauff

House of Commodore
8835 Satyr Hill Road
Baltimore, MD 21234
Contact: Ernest J. Fischer

Long Lines Computer Club
323 N. Charles St., Rm. 201
Baltimore, MD 21201
Gene Moff

VIC & 64 Users Group
The Boyds Connection
21000 Clarksburg Rd.
Boyds, MD 20841
(301) 428-3174
Tom DeReggi

Rockville VIC/64 Users Group
P.O. Box 8805
Rockville, MD 20856
(301) 231-7823
Tom Pounds

The Compucats' Commodore
Computer Club
680 W. Bel Air Ave.
Aberdeen, MD 21001
(301) 272-0472
Betty Jane Schueler

Westinghouse BWI
Commodore User Group
Attn: L. Barron Mail Stop 5156
P.O. Box 1693
Baltimore, MD 21203

HUG (Hagerstown Users Group)
23 Coventry Lane
Hagerstown, MD 21740
(301) 797-9728
Joseph Rutkowski
1st & 3rd Fri. of Month

The Montgomery Ct. Commodore
Computer Soc.
P.O. Box 6444
Silver Springs, MD 20906
(301) 946-1564
Meryle Pounds

Commodore Users Group of Annapolis
P.O. Box 9726
Arnold, MD 21012
(301) 974-4548
The Software Co.

MASSACHUSETTS

Eastern Massachusetts
VIC Users Group
c/o Frank Ordway
7 Flagg Road
Marlboro, MA 02173

VIC Users Group
c/o Ilene Hoffman-Sholar
193 Garden St.
Needham, MA 02192

Commodore Users Club
Stoughton High School
Stoughton, MA 02072
Contact: Mike Lennon

Berkshire PET Lovers
CBM Users Group
Taconic High
Pittsfield, MA 01201

The Boston Computer
Society
Three Center Plaza
Boston, MA 02108
(617) 367-8080
Mary E. McCann

Masspet Commodore Users Group
P.O. Box 307
East Taunton, MA 02718
David Rogers

Raytheon Commodore Users Group
Raytheon Company
Hartwell Rd. GRA-6
Bedford, MA 01730
John Rudy

Commodore 64 Users
Group of The Berkshires
184 Highland Ave.
Pittsfield, MA 01201
Ed Rucinski

VIC Interface Club
48 Van Cliff Ave.
Brockton, MA 02401
Bernie Robichaud

Cape Cod 64 Users Group
358 Forrest Rd.
S. Yarmouth, MA 02664
1 (800) 225-7136
Jim Close
(In MA. call) 1 (800) 352-7787

The Cursor Club
442 Mulpuf Rd.
Lunenburg, MA 01462
(617) 582-0529
John

Pioneer Valley VIC/64 Club
34 Bates St.
Westfield, MA 01085
(413) 562-1027
Marvin Yale
3rd Thurs. of month

MICHIGAN

David Liem
14361 Warwick Street
Detroit, MI 48223

VIC Users Club
University of Michigan
School of Public Health
Ann Arbor, MI 48109
Contact: John Gannon

Commodore User Club
32303 Columbus Drive
Warren, MI 48093
Contact: Robert Steinbrecher

Commodore Users Group
c/o Family Computer
3947 W. 12 Mile Rd.
Berkley, MI 48072

VIC for Business
6027 Orchard Ct.
Lansing, MI 48910
Mike Marotta

South Computer Club
South Jr. High School
45201 Owen
Belleville, MI 48111
Ronald Ruppert

Commodore Users Group
c/o Eaton Rapids Medical Clinic
101 Spicerville Hwy.
Eaton Rapids, MI 48827
Albert Meinke III, M.D.

South East Michigan Pet
Users Group
Box 214
Farmington, MI 48024
Norm Eisenberg

Commodore Computer Club
4106 Eastman Rd.
Midland, MI 48640
(517) 835-5130
John Walley
9:30 p.m. Sept/May

VIC, 64, PET Users Group
8439 Arlis Rd.
Union Lake, MI 48085
363-8539
Bert Searing

COMP
486 Michigan Ave.
Marysville, MI 48040
(313) 364-6804
M. Gauthier

Ann Arbor Commodore Users Group
Ann Arbor, MI 48103
(313) 994-4751
Art Shaw
3rd Tues. 7:30-10:00

DAB Computer Club
P.O. Box 542
Watervliet, MI 49098
(616) 463-5457
Dennis Burlingham

West Michigan Commodores
c/o R. Taber
1952 Cleveland Ave., S.W.
Wyoming, MI 49509
(616) 458-9724
Gene Traas

Debug
P.O. Box 196
Berrien Springs, MI 49103
(616) 471-1882
Herbert Edward
Last Thursday of Month

Jackson Commodore Computer Club
201 S. Grinnell St.
Jackson, MI 49203
Alfred Bruey
Last Thur. of Month 7:30 p.m.

SMCUG
1002 Pfau St.
Mankato, MI 56001
(507) 625-6942
Dean Otto

SEM 64
25015 Five Mile #3
Redford, MI 48239
(313) 537-4163
Gary Groeller

MINNESOTA

MUPET (Minnesota Users
of PET)
P.O. Box 179
Annandale, MN 55302
c/o Jon T. Minerich

Twin Cities Commodore
Computer Club
6623 Ives Lane
Maple Grove, MN 55369
(612) 424-2425
Contact: Rollie Schmidt

Brainerd Area Commodore Users Group
1219 S.E. 11th St.
Brainerd, MN 56401
(218) 829-0805
Norm Saavedra
1st Thurs. 6 p.m. & 3rd Sat. 10 a.m.

MISSISSIPPI

Commodore Biloxi
User Group (ComBUG)
Universal Computer Services
3002 Hwy. 90 East
Ocean Springs, MS 39564
(601) 875-1173
John Lassen

MISSOURI

KCPUG
(Commodore User Group of
Kansas City)
P.O. Box 36492
Kansas City, MO 64111
(816) 252-7628
Salvadore

Commodore User Group of St. Louis
Box 6653
St. Louis, MO 63125-0653
Dan Weidman, New Members
1541 Swallowtail Dr.
St. Louis, MO

VIC INFONET
P.O. Box 1069
Branson, MO 65616
(417) 334-6099
Jory Sherman

Worth County PET Users
Group
Grant City, MO
(816) 564-3551
David Hardy

Mid-Missouri Commodore Club
1804 Vandiver Dr.
Columbia, MO 65201
(314) 474-4511
Phil Bishop

Joplin Commodore Computers
Users Group
422 S. Florida Ave.
Joplin, MO 64801
R. D. Connely

MONTANA

Powder River
Computer Club

access: commodore user groups

Powder River County
High School
Broadus, MT 59317
Contact: Jim Sampson

Commodore User Club
1109 West Broadway
Butte, MT 59701
Contact: Mike McCarthy

NEBRASKA

Greater Omaha Commodore 64
Users Group
2932 Leawood Dr.
Omaha, NE 68123
(402) 292-2753
Bob Quisenberry

NEVADA

Las Vegas PET Users
Suite 5-315
5130 E. Charleston Blvd.
Las Vegas, NV 89122
Gerald Hasty

Compu Club 64
4220 S. Maryland Parkway
Bldg. B—Suite 403
Las Vegas, NV 89109
(702) 369-7354
Cindy Springfield

NEW JERSEY

Commodore Friendly User Group
49 Hershey Rd.
Wayne, NJ 07470
(201) 696-8043
Rich Pinto/Colin Campbell

Somerset Users Club
49 Marcy Street
Somerset, NJ 08873
Contact: Robert Holzer

Educators Advisory
P.O. Box 186
Medford, NJ 08055
(609) 953-1200
John Handfield

VIC-TIMES
46 Wayne Street
Edison, NJ 08817
Thomas R. Molnar

VIC 20 User Group
67 Distler Ave.
W. Caldwell, NJ 07006
(201) 284-2281
G. M. Amin

VIC Software Development Club
77 Fomalhaut Ave.
Sewell, NJ 08080
H. P. Rosenberg

ACGNJ PET/VIC/CBM
User Group
30 Riverview Terr.
Belle Mead, NJ 08502
(201) 359-3862
J. M. Pylka

South Jersey Commodore
Users Club
46-B Monroe Park
Maple Shade, NJ 08052
(609) 667-9758
Mark Orthner
2nd Fri. of month

Parsippany Computer Group
51 Ferncliff Rd.
Morris Plains, NJ 07950
(201) 267-5231
Bob Searing

Information 64
16 W. Ridgewood Ave.
Ridgewood, NJ 07450
(201) 447-4432
Dave Garaffa

NEW HAMPSHIRE

Northern New England
Computer Society
P.O. Box 69
Berlin, NH 03570

TBH VIC-NICs
P.O. Box 981
Salem, NH 03079

C-64 U.S.E.R.S. User Software
Exchange Pro
P.O. Box 4022
Rochester, NH 03867
Paul Kyle

NEW MEXICO

Commodore Users Group
6212 Karlson, NE
Albuquerque, NM 87113
(505) 821-5812
Danny Byrne

NEW YORK

Capital District 64/VIC 20
Users Group
363 Hamilton St.
Albany, NY 12210
(518) 436-1190
Bill Pizer

Long Island PET Society
Ralph Bressler
Harborfields HS
Taylor Avenue
Greenlawn, NY 11740

PET User Club
of Westchester
P.O. Box 1280
White Plains, NY 10602
Contact: Ben Meyer

LIVE (Long Island
VIC Enthusiasts)
17 Picadilly Road
Great Neck, NY 11023
Contact: Arnold Friedman

Commodore Masters
25 Croton Ave.
Staten Island, NY 10301
Contact: Stephen Farkouh

VIC Users Club
76 Radford St.
Staten Island, NY 10314
Contact: Michael Frantz

West Chester County VIC
Users Group
P.O. Box 146
Pelham, NY 10552
Joe Brown

SPUG
4782 Boston Post Rd.
Pelham, NY 10803
Paul Skipski

VIC 20 User Club
151-28 22nd Ave.
Whitestone, NY 11357
Jean F. Coppola

VIC 20 User Club
339 Park Ave.
Babylon, NY 11702
(516) 669-9126
Gary Overman

VIC User Group
1250 Ocean Ave.
Brooklyn, NY 11230
(212) 859-3030
Dr. Levitt

L&M Computer Club
VIC 20 & 64
4 Clinton St.
Tully, NY 13159
(315) 696-8904
Dick Mickelson

Commodore Users Group
1 Corwin Pl.
Lake Katrine, NY 12449
J. Richard Wright

VIC 20/Commodore 64
Users Group
31 Maple Dr.
Lindenhurst, NY 11757
(516) 957-1512
Pete Lobol

VIC Information Exchange
Club
336 W. 23 St.
Deer Park, NY 11729
Tom Schlegel
SASE & phone please

New York Commodore
Users Group
380 Riverside Dr., 7Q
New York, NY 10025
(212) 566-6250
Ben Tunkelang

Hudson Valley Commodore Club
1 Manor Dr.
Woodstock, NY 12498
F.S. Goh
1st Wednesday of month

LIVICS (Long Island VIC Society)
20 Spyglass Lane
East Setauket, NY 11733
(516) 751-7844
Lawrence Stefani

VIC Users Group
c/o Stoney Brook Learning Center
1424 Stoney Brook Rd.
Stoney Brook, NY 11790
(516) 751-1719
Robert Wurtzel

Poughkeepsie VIC User Group
2 Brooklands Farm Rd.
Poughkeepsie, NY 12601
(914) 462-4518
Joe Steinman

VIC 20 User Group
Paper Service Division
Kodak Park
Rochester, NY 14617
David Upham, Sr.

Manhattan 64
426 West 48th
New York, NY 10036
(212) 242-3900
Charles Honce

Adirondack Commodore 64
Users Group
205 Woodlawn Ave.
Saratoga Springs, NY
(518) 584-8960
Paul Klompas

Rockland County Commodore
Users Group
P.O. Box 573
Nanuet, NY 10965
Ross Garber

New York 64 Users Group
222 Thompson St.
New York, NY 10012
(212) 673-7241
Bruce Cohen

Finger Lakes Commodore
Users Group
c/o Rose City Computer Associates
229 West Union St.
Newark, NY 14513
(315) 331-1185

The Commodore Users Group
Rochester
78 Hardison Rd.
Rochester, NY 14617
(716) 544-5251
Tom Werenski
Phone Evenings between 7-10

Commodore Computer Club
Publications Dept.,
Grumman Aerospace
1111 Stewart Ave.
Bethpage, NY 11714
(516) 575-9558
Neil Threulsen

Hello, Central!
76-12 35th Ave.
Jackson Heights, NY 11372
Jared Sherman

VIC 20/64 Users Group
NYU Waverly Place
New York, NY 10003
(212) 358-5155
Lawrence Schulman

SCUG (Schenectady Commodore
Users Group)
c/o the Video Connection
Canal Square
Schenectady, NY 12305
Timothy Davis
1st Mon. of Month

Commodore 64 Users Group
S.U.N.Y. at Oswego
Dept. of Industrial Arts
Oswego, NY 13126
John R. Boronkay

NORTH CAROLINA

Amateur Radio PET Users Group
P.O. Box 30694
Raleigh, NC 27622
Contact: Hank Roth

VIC Users Club
c/o David C. Fonenberry
Route 3, Box 351
Lincolnton, NC 28092

Microcomputer Users Club
Box 17142 Bethabara Sta.
Winston-Salem, NC 27116
Joel D. Brown

VIC Users Club
Rt. 11, Box 686
Hickory, NC 28601
Tim Gromlovits

Raleigh VIC 20/64 Users Group
410-D Delta Court
Cary, NC 27511
(919) 469-3862
Larry Diener

Down East Commodores
302 Belltown Rd.
Havelock, NC 28532
(919) 447-4536
Bruce Thedin

Tryon Commodore 64 Club
P.O. Box 1016
Tryon, NC 28782
(704) 859-6340
Robin Michael
1st Mon. of month at 7 p.m.

OHIO

Dayton Area PET
User Group
933 Livingston Drive
Xenia, OH 45385
B. Worby, President
(513) 848-2065
J. Watson, Secretary
(513) 372-2052

Central Ohio PET
Users Group
107 S. Westmoor Avenue
Columbus, OH 43204
(614) 274-0304
Contact: Philip H. Lynch

Commodore Computer Club
of Toledo
734 Donna Drive
Temperance, MI 48182
Gerald Carter

Chillicothe Commodore
Users Group
P.O. Box 211
Chillicothe, OH 45601
William A. Chaney

Licking County 64 Users Group
323 Schuler St.
Newark, OH 43055
(614) 345-1327

11433 Pearl Rd.
Strongsville, OH 44136
Paul M. Warner

C.P.U. Connection
P.O. Box 42032
Brook Park, OH 44142
Danni Hudak

Commodore Users Group
18813 Harlan Dr.
Maple Heights, OH 44137
(216) 581-3099
Carl Skala

Commodore Users of
Blue Chip (Cincinnati)
816 Beecher St.
Cincinnati, OH 45206
(513) 961-6582
Ted Stalets

Southwestern Ohio Commodore
Users Group
P.O. Box 399117
Cincinnati, OH 45239
2nd Wed. of month at 7 p.m.

OKLAHOMA

Southwest Oklahoma
Computer Club
c/o Commodore Chapter
P.O. Box 6646
Lawton, OK 73504
1:30 at Lawton City Library

Tulsa Area Commodore Users Group
Tulsa Computer Society
P.O. Box 15238
Tulsa, OK 74112
Annette Hinshaw

Commodore Oklahoma Users Club
4000 NW 14th St.
Oklahoma City, OK 73107
(405) 943-1370
Stanley B. Dow

Commodore Users
Box 268
Oklahoma City, OK 73101
Monte Maker, President

Commodore Users of Norman
209 Brookwood
Noble, OK 73068
Matt Hager

Commodore Users Group
Muskogee Computer Society
202 S. 12th St.
Muskogee, OK 74401
Steve Ford

OREGON

NW PET Users Group
John F. Jones
2134 N.E. 45th Avenue
Portland, OR 97213

U.S. Commodore Users Group
P.O. Box 2310
Roseburg, OR 97470
(503) 672-7591
Richard Tsukiji

Southern Oregon VIC/64
Users Group
3600 Madrona Lane
Medford, OR 97501
(503) 779-7631
James Powell

PENNSYLVANIA

PET User Group
Gene Beals
P.O. Box 371
Montgomeryville, PA 18936

Penn Conference Computer Club
c/o Penn Conference of SDA
720 Museum Road
Reading, PA 19611
Contact: Dan R. Knepp

PACS Commodore Users Group
LaSalle College
20th & Olney Ave.
Philadelphia, PA 19141
(215) 951-1258
Stephen Longo

Glen Schwartz
807 Avon
Philadelphia, PA 19116

Gene Planchak
4820 Anne Lane
Sharpsville, PA 15150
(412) 962-9682

PPG (Pittsburgh PET Group)
c/o Joel A. Casar, DMD
2015 Garrick Drive
Pittsburgh, PA 15235
(412) 371-2882

Westmoreland Commodore
Users Club
c/o DJ & Son Electronics
Colonial Plaza
Latrobe, PA 15650
Jim Mathers

Commodore Users Club
3021 Ben Venue Dr.
Greensburg, PA 15601
(412) 836-2224
Jim Mathers

VIC 20 Programmers, Inc.
c/o Watson Woods
115 Old Spring Rd.
Coatesville, PA 19320
Robert Gougher

G.R.C. User Club
300 Whitten Hollow Rd.
New Kensington, PA 15068
Bill Bolt

NADC Commodore Users Club
248 Oakdale Ave.
Horsham, PA 19044
Norman McCrary

CACC (Capitol Area Commodore
Club)
134 College Hill Rd.
Enola, PA 17025
(717) 732-2123
Lewis Buttery
Union Deposit Mall at 7 p.m.

G/C Computer Owners Group
c/o Gilbert Associates, Inc.
P.O. Box 1498
Reading, PA 19607
Extension 6472
Jo Lambert (215) 775-2600

Boeing Employees Personal
Computer Club
The Boeing Vertol Co.
P.O. Box 16858
Philadelphia, PA 19142
(215) 522-2257
Jim McLaughlin

South Central PA Commodore Club
2109 Cedar Run Dr.
Camp Hill, PA 17011
(717) 763-4219
David Persing

Main Line Commodore Users
Group (MLCUG)
c/o Main Line Computer Center
1046 General Allen Lane
West Chester, PA 19380
(215) 388-1581
Emil Volcheck

Commodore Users Group
781 Dick Ave.
Warminster, PA 18974
Matt Matulaitis

The Commodore Users Club
of S.E. Pittsburgh
c/o Groves Appliance & TV
2407 Pennsylvania Ave.
West Mifflin, PA 15122
Charles Groves

Compstars
130 Blue Teal Circle
Audubon, PA 19403
Mike Norm
Meet at Audio Video Junct.

Scranton Commodore Users Group
P.O. Box 211
Clarks Summit, PA 18411

Clifton Heights Users Group
P.O. Box 235
Clifton Heights, PA 19018

Oxford Circle 64 Users Group
Frankford Cong. Un. Church of Christ
Oxford Ave. & Pratt St.
Philadelphia, PA 19124
(215) 743-8999
Roger Nazeley (215) 535-9021
4th Wed. of Month

VIC Software Development Club
440 W. Sedgwick
Apt. A-1
Philadelphia, PA 19119
(215) 844-4328
Tracy Lee Thomas

Bits & Bytes
1015 Dale Rd.
Secane, PA 19018
(215) 544-5875
Dave Boodey

CACCC-Centre Area Commodore
Computer Club
214 Computer Building
University Park, PA 16802
(814) 237-5912
Bill Hillner

PUERTO RICO

CUG of Puerto Rico
RFD #1, Box 13
San Juan, PR 00914
Ken Burch

VIC 20 User Group
655 Hernandez St.
Miramar, PR 00907
Robert Morales, Jr.

RHODE ISLAND

Irving B. Silverman, CPA
160 Taunton Ave.
E. Providence, RI 02914
Contact: Michelle Chavanne

Newport VIC/64 Users
10 Maitland Ct.
Newport, RI 02840
(401) 849-2684
Dr. Matt McConeghy

The VIC 20 Users Club
Warwick, RI 02886
Tom Davey

Commodore Users Group
c/o Data-Co.
978 Tiogue Ave.
Coventry, RI 02816
(401) 828-7385
Victor Moffett

SOUTH CAROLINA

Beaufort Technical College
100 S. Ribaut Rd.
Beaufort, SC 29902
Dean of Instruction

Computer Users Society
of Greenville (CUS)
Horizon Records-Home Computers
347 S. Pleasantburg Dr.
Greenville, SC 29607
(803) 235-7922
Bo Jeanes

Commodore Computer Club
of Columbia
318 Quincannon Dr.
Columbia, SC 29210
Buster White Sect./Treas.

Spartanburg Commodore
Users Group
803 Lucerne Dr.

access:
commodore user groups

Spartanburg, SC 29302
(803) 582-5897
James Pasley

SOUTH DAKOTA

PET User Group
515 South Duff
Mitchell, SD 57301
(605) 996-8277
Contact: Jim Dallas

VIC/64 Users Club
608 West 5th
Pierre, SD 57501
(605) 224-4863
Larry Lundeen

TENNESSEE

River City Computer
Hobbyists
Memphis, TN
1st Mon. at Main Library

Nashville Commodore Users Group
P.O. Box 121282
Nashville, TN 37212
(615) 331-5408
Dave Rushing
3rd Thurs. at Cumberland Mus

Commodore User Club
Metro Computer Center
1800 Dayton Blvd.
Chattanooga, TN 37405
Mondays 7:30 pm

Metro-Knoxville Commodore
Users Club
7405 Oxmoor Rd., Rt. #20
Knoxville, TN 37921
(615) 938-3773
Ed Pritchard

Memphis Commodore Users Group
2476 Redvers Ave.
Memphis, TN 38127
(901) 358-5823
Harry Ewart

TEXAS

PET Users
2001 Bryan Tower
Suite 3800
Dallas, TX 75201

Larry Williams
P.O. Box 652
San Antonio, TX 78293

PET User Group
John Bowen
Texas A & M
Microcomputer Club
Texas A & M, TX

CHUG (Commodore Houston
Users Group)
8738 Wildforest
Houston, TX 77088
(713) 999-3650
Contact: John Walker

Commodore Users Group
5326 Cameron Rd.
Austin, TX 78723
(512) 459-1220
Dr. Jerry D. Frazee

VIC Users Group
3817 64th Dr.
Lubbock, TX 79413

64 Users Group
2421 Midnight Circle
Plano, TX 75075
S.G. Grodin

Savid Computer Club
312 West Alabama
Suite 2
Houston, TX 77006
Davi Jordan, Chairman

Gulf Coast Commodore
Users Group
P.O. Box 128
Corpus Christi, TX 78403
(512) 887-4577
Lawrence Hernandez

Mid-Cities Commodore Club
413 Chisolm Trail
Hurst, TX 76053
Garry Wordelman

Mid-Cities Commodore Club
413 Chisolm Trail
Hurst, TX 76053
Bruce Nelson

Interface Computer Club
814 North Sabinas
San Antonio, TX 78207
M. E. Garza, President

Gulf Coast Commodore
Users Group
P.O. Box 128
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Learning about LOGO

by David Malmberg
Fremont, California

Our favorite LOGO expert suggests books that will help you learn about Commodore 64 LOGO.

During the last few months there has been an avalanche of books published about LOGO. These books can present a bewildering array of alternatives because the target reader ranges from a young child with no computer knowledge to a college student taking an advanced level computer science or mathematics course. To further the confusion there are several dialects of LOGO, so a book written about TI or Atari LOGO may actually hinder the learning process for someone using Commodore's excellent LOGO on the 64. By reviewing books that will be helpful for learning Commodore LOGO, this article attempts to eliminate some of this confusion.

First, let's look at some of LOGO's dialects. LOGO was originally developed at the Massachusetts Institute of Technology (MIT) in the late 1960's and for a long time LOGO meant MIT LOGO. As the language was implemented on a variety of personal computers each implementor seemed to make changes in the language syntax and to add features to the language to exploit the capabilities of his unique computer hardware. Incidentally, Commodore is no exception. Commodore LOGO has sprite-handling and sound capabilities not found in any other version of LOGO. Fortunately, however, Commodore's LOGO was implemented on the 64 by a company named Terrapin, Inc., which followed the original MIT version very closely. Terrapin also developed a version of LOGO for the Apple personal computer. Another firm, Krell Software, also implemented an MIT-based version of LOGO for the Apple. These MIT-based versions represent the *standard* LOGO language. As a result any book or article that deals with MIT LOGO, Terrapin LOGO or Krell LOGO (even if aimed at the Apple programmer) will be almost 100% compatible with Commodore LOGO.

Other versions of LOGO are less compatible. Apple released its own version called (not surprisingly) Apple LOGO which is about 85% compatible with Commodore LOGO. TI, Radio Shack, Atari, and Mattel each have their own LOGOs. Books have been written about all of these versions. As long as these books focus on the simpler aspects of LOGO, such as turtle graphics, they may be helpful to someone learning Commodore LOGO. However, if you wish to advance beyond simple graphics, books on these other computers' LOGOs should be avoided.

The reviews that follow will be arranged in order of increasing difficulty. The first few books are aimed at children eight years and older and the last one is a college-level text.

1,2,3 My Computer & Me by Donna Bearden (Reston Publishing—99 pages—$10.95) The subtitle for this book is "A LOGO Funbook for Kids." This subtitle is quite apt because the book is fun and is strictly for kids. Focusing only on turtle graphics, the book introduces many LOGO programming concepts including procedures, variables and recursion. The book has large print, very helpful and humorous illustrations and a number of clever projects. The book is designed as a workbook in which the child writes programs and draws turtle graphic designs in blank spaces in the book after trying his or her programs on the computer. This is an excellent first LOGO book for children ages eight to about eleven. The book could also be used by younger children with help from an adult. Recommended.

LOGO Discoveries by Margaret Moore (Creative Publications—74 pages—$8.00) This is also a workbook aimed at children as young as eight, but it will require either a parent's or a teacher's help. The book is specifically designed for classroom use, with sections for the teacher and activities and exercises for the students. The publisher grants permission to copy and distribute the material for use in the classroom. Parents who want to learn LOGO along with their children will also find this book very rewarding. The book is truly an outstanding introduction to LOGO's turtle graphics. There are 51 separate activities and a rich variety of projects. The projects emphasize *discovery.* Students are encouraged to experiment and even to make mistakes and to learn from their mistakes. There are complete answers to the more difficult projects. There is a "Personal Dictionary" section in which students build their own LOGO reference guide. Highly recommended.

Learning with LOGO by Daniel Watt (McGraw-Hill—365 pages—$19.95) This book is aimed at children as young as ten. It also has specific sections called "Helper's Hints", which are aimed at the parent or teacher. In addition, the book has special sections labeled "Pitfalls," "Powerful Ideas," and "Explorations" that contain many insights into LOGO and how it should be learned and taught. It is a large, spiral-bound book, with large print and headlines in the margins. It is profusely illustrated with pictures of the computer's screen and very clever cartoons. The cartoons often convey the ideas far better than the words. The book has a number of major projects including two LOGO games, "Shoot" and "Quickdraw," that are presented in detail. Other projects include a turtle racetrack, a math quiz and a poetry generator. The book covers LOGO's powerful list-handling capability, although the main emphasis is on turtle graphics. This is an excellent book and is highly recommended.

A note of caution: There is another book by the same author entitled *Learning with Apple LOGO* which is not as compatible with Commodore LOGO. Don't buy that book by mistake.

Discovering Apple LOGO by David Thornburg (Addison-Wesley—145 pages—$14.95) This is a *different* kind of LOGO book as can be seen by the book's subtitle: "An Invitation to the Art and Pattern of Nature." Since the book is devoted to turtle graphics only, it is still very compatible with Commodore LOGO. The book is suitable for self-study by someone as young as twelve. However, most of the book's rather unusual subject material will be of more interest to an older audience. The book deals with three broad topics: graphic art, geometry and computer programming. It covers such fascinating subjects as symmetry (both static and dynamic), tessellations (interlocking repeating patterns), recursion, the golden mean, Fibonacci series and fractals. The book is full of great turtle graphic examples and would be an excellent idea and source book for a teacher using LOGO in a classroom environment. If you are a serious student of LOGO, this book should be the second book you buy. It should probably not be your first LOGO book, because there are other books that teach LOGO better and more comprehensively. Still, because the book is both unique and excellent, it is highly recommended.

LOGO: An Introduction by Dale Burnett (Creative Computing Press—67 pages—$7.95) This book is really targeted at elementary and junior high teachers, although the publisher claims it is suitable for self-study by students as well. The book is poorly written, poorly edited and too expensive. Not recommended.

Apple LOGO Primer by Gary Bitter and Nancy Watson. (Reston Publishing—206 pages—$14.95) By the time this review is printed there should be a version of this book specifically for Commodore LOGO. In the comments that follow, I am assuming the Commodore version will follow the Apple version fairly closely. The book is divided into three main sections. Part one is a step-by-step introduction to the LOGO language for the beginner. Part two is a quick overview of LOGO for someone who is al-

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ready familiar with other programming languages. The last part covers the history and philosophy behind LOGO. Part one is suitable for someone as young as twelve or thirteen; the other sections are aimed at older readers. The book emphasizes turtle graphics. There are only five pages on LOGO list- and text-handling capabilities. Numerous pictures of what should be seen on the screen are used to illustrate the examples. Complete answers for all exercises are given in the back of the book. Certain topics are extremely well presented and some, such as animation, are quite unique. The book is a good overall introduction to LOGO's graphics and philosophy. Recommended if you do not intend to explore LOGO beyond turtle graphics.

LOGO—A Language for Learning by Virginia Grammer, Paul Goldenberg, and Leigh Klotz (Commodore—approximately 400 pages) This is the manual that comes with the Commodore LOGO package. As such, it is the best documentation, in my opinion, that Commodore has ever provided with any of their products. The book is very well written and edited. The first part of the book is written in a tutorial format and is quite easy to follow. This tutorial is suitable for self-study by fourteen- and fifteen-year olds. It could also be used by younger people with help. The last part of the book is a detailed reference manual on the LOGO language. The book is filled with projects that are well thought out and well presented. It is the only source available (currently) for such topics as using sprites, sound and assembly language routines in your Commodore LOGO programs. The book also contains the complete documentation for all the utility programs included in the LOGO package. My only complaints are the smallness of the print and the fact that the book is not spiral bound. These complaints aside, this is a superb book that contributes significantly to making Commodore LOGO an outstanding product. Highly recommended.

Introducing LOGO by Peter Ross (Addison-Wesley—249 pages—$12.95) This happens to be one of my favorite computer books (on LOGO or any other topic)—but it is not for everyone. Written by a teacher at the University of Edinburgh, the book is loaded with valuable insights for someone who is trying to teach LOGO. As such, it may not be the best book to learn from (unless you are quite computer literate), but it is an excellent book from which to teach. The book is filled with sections called "Digressions", in which the author presents personal observations on such topics as artificial intelligence, top-down versus bottom-up program design and approaches to problem solving. The author has a droll sense of humor—his definition of the programming language LISP is a classic! The book presents several very unique LOGO projects including an analog clock using turtle graphics and a structured "pretty print" program using LOGO's list-processing capabilities. For a relatively sophisticated audience this is an outstanding book and is highly recommended. However, the book is not appropriate for the computer neophyte.

LOGO for the Apple II by Harold Abelson (BYTE/McGraw-Hill—228 pages—$14.95) This book deals with the MIT version of LOGO developed by Terrapin, Inc. for the Apple. Since Terrapin also developed Commodore's LOGO, this book is an excellent choice for the Commodore owner. The book is aimed at an adult audience although it does not assume any prior computer knowledge on the part of the reader. The book is very well written and all of the features of LOGO, including list processing, are developed in detail. The book presents several major projects including the famous "Doctor" program that simulates a psychotherapist. Chapter three is an excellent source for turtle graphic examples and ideas. This book is highly recommended for adults learning LOGO.

A note of caution: There is another book by the same author entitled *Apple LOGO,* which is not compatible with Commodore LOGO. Be sure to get the right book.

Mindstorms by Seymour Papert (Basic Books—230 pages—$6.95) The author is the father of LOGO. His book does not teach the LOGO language *per se,* but rather it explains the history and philosophy behind LOGO. If you are interested in education and/or the psychology of learning you will find this book both fascinating and thought-provoking. Highly recommended if you are interested in the "why" of LOGO as opposed to the "how" that is covered in the other books.

Turtle Geometry by Harold Abelson and Andrea diSessa (The MIT Press—477 pages—$22.50) This is a book only for the dedicated LOGO specialist. It is a college-level text that begins with turtle graphics and proceeds through such topics as vector operations, topology of curves, maze-solving algorithms, spherical geometry and Einstein's General Theory of Relativity (honest!) Recommended only for would-be experts.

Young Peoples' LOGO Association (P.O. Box 855067 Richardson, Texas 75085) No discussion of learning about LOGO would be complete without mentioning the YPLA's "Turtle News." This is a monthly newsletter on LOGO with articles aimed at both youngsters and adults. Each issue contains numerous programs, many of which are written by children for other children. YPLA also offers a software exchange service where you can get disks filled with programs either in exchange for programs you submit or for a modest copying fee. Currently YPLA has seven disks full of Commodore software—not all of which are LOGO. Annual dues to YPLA, which entitle you to a "Turtle News" subscription and software exchange privileges, are $9.00 if you are 18 years or younger and $25.00 otherwise. Highly recommended. **C**

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Touch 'n Grow: The KoalaPad™

by Betsy Byrne

This easy-to-use touch tablet makes creating graphics on the 64 a snap.

All the experts are predicting that in a few years keyboards will become obsolete as computer input devices. Instead, they tell us, we will be entering our commands with "mice", or even just our voices. I have never been too fond of mice, ever since a mouse set up housekeeping in my collection of classic science fiction paperbacks from the fifties. It has also been my personal experience that voice commands don't work too well—with children anyway—and I usually have to resort to a firm "touch" in the area designated for manual control before many of my commands are executed by intelligent but unreliable offspring. With this in mind, I was understandably enthusiastic when I heard about the KoalaPad™, a computer "touch tablet" produced and marketed by Koala Technologies Corporation in Los Altos, California.

When I read about the KoalaPad my first reaction was to imagine how children might respond to it. I felt that if this thing was all it was cracked up to be—sketch pad, custom keyboard, controller for games and applications software —it would be a *wonderful* way for young children to learn to operate computers. For the three to seven year-old set, using Koala could eliminate the frustration of endlessly searching for elusive letters on the keyboard, fighting with awkward joysticks designed for larger hands and righteous anger at inaccurate light pens that pick the wrong answer.

Until I actually obtained a KoalaPad, (with an eye toward writing this article) I had never even *considered* that *adults* might find a Koala useful. But I hadn't reckoned with the versatile *Koala Painter,* a "graphics processor" from Audio Light, that comes packaged with the Commodore 64 version of the KoalaPad. I call *Koala Painter* a graphics processor because the label "computer drawing program" doesn't even come close to describing what K Painter does when combined with the 16 colors, 320-by-200 resolution and multi-screen memory capability of the Commodore 64. Even if this program used a joystick (joysticks seem cumbersome after just one session with Koala), the key board or a light pen, it would still be way ahead of the competition. The clarity and sharpness of pictures made with the K Painter are truly awesome.

The KoalaPad with *Koala Painter* has features that, as far as I know, are found only on $5,000.00 dedicated graphics terminals or color micros costing as much. It is frankly heartwarming to see the Commodore 64 performing feats such as "mirror" (each line, circle or shape drawn is echoed in four places on the screen), "copy" (draw one sheep and copy it to create an entire flock), "swap" (switch back and forth or "copy" between two resident screens), and "zoom" (add details dot-by-dot, pixel-by-pixel, all the time seeing where you are on the larger screen), as well as more prosaic tasks like "circle", "fill", "box", "line", and of course—"draw".

Wonder of wonders, K Paint also has something called "X Color" that allows the artist to change all the red to, say, blue if she doesn't like the way her rainbow is turning out. The magical "oops" function can turn it back to red again if the results weren't quite what she expected—"oops" UNdoes whatever was done last! It's easy to see why the kids at our house had quite a fight on their hands when they wanted to put the KoalaPad through its paces—at least for the first few weeks.

The program that comes with the VIC 20 version of the KoalaPad, *Dancing Bear,* is an excellent example of how devices like Koala may change the way that children interact with the computer. This multi-faceted learning game comes with an overlay for the KoalaPad that has pictures of the dancing bear's arms, legs, head, etc. In one mode of the program, the child touches these parts in a sequence he or she designs and the resulting dance steps are then animated on the VIC's screen. Every child (or adult!) that I have seen use this program has become immediately enchanted with it. Why? Of course the excellent graphics and music *may* have something to do with its popularity, but I firmly believe that the Koala makes the interaction between user and computer very . . . I think that "natural" would be the correct word. The computer term that I have heard applied is "transparent"—not a bad word, since using the KoalaPad is so simple. It almost seems that you are *thinking* information onto the screen.

You may have noticed by now that the lion's share of this article has talked about the software associated with the KoalaPad, rather than the hardware—for a very good reason. No hardware, be it ever so sophisticated is worth a hill of beans without quality software to make it do its stuff.

The Koala hardware is a small (6 inches by 8 inches by one inch) rectangular plastic device that attaches to either a VIC 20 or a Commodore 64 with a cable that has a connector for the joystick port. To use the pad, a pointed plastic stylus is provided, but for many applications a finger works just as well. There are two buttons above the pressure sensitive pad, that perform like the buttons on a joystick (or, heaven forbid, a mouse) for menu selection, starting game action, etc.

Probably the most comfortable way to use Koala is to rest it on your knee or lap, steadying it with one hand and operating it with the other. Our family really appreciated the small, easily manipulated design, since at least three of us (myself not included, alas) have small knees, laps and hands. The design and material both seem tough as nails—nothing used by kids at our house would survive for long if it weren't. The only cautionary note is in reference to using sharp objects in place of the stylus; apparently this can damage the surface of the pad.

That's the hardware folks—a neat little bundle of power that can move mountains with the right software loaded in. The software for the 64 comes exclusively on disk at this time, but *Dancing Bear* for the VIC is on cartridge.

In addition to the software I have already mentioned, there is one more program that comes with the KoalaPad—*Spider Eater,* a music game for the Commodore 64. This one did not impress me nearly as much as the other two did, since with its one-octave keyboard, *Spider* doesn't even come close to exercising the 64's prodigious musical skills. It is an interesting way to learn about music, however, and the invisible spider section could be helpful in developing an "ear" for music while having a whale of a good time.

I expect, possibly by the time this article sees print, to see more software for the Koala that will match—or exceed—the quality of *K Painter* and *Dancing Bear.* I can envision *no* area of computing that could not benefit from using the Koala as a controller—business applications to fast action games. I'm sure people are working on *Koalagrams (Bearware?)* to enhance them all, and maybe even a few applications no one else has thought of yet!

Koala was designed and patented by a very imaginative fellow indeed—Dr. David Thornburg, whose name was familiar to me from his excellent "Friends of the Turtle" columns in *COMPUTE!* magazine. He is also the author of *Every Kid's First Book of Robots and Computers,* a favorite at our house for some time now.

I called David in California to ask about the Koala, somehow mastering the shyness that always comes over me when I talk to people I admire enormously. He told me that he designed the Koala pad to make computer technology more accessible to users at an affordable price. We went on to discuss children using the Koala, and he said that he can foresee numerous programs that will use keyboard overlays for the programmed area of the pad. Design of the various programs would conform to the age, abilities and motor skills of whatever age group the software is designed for.

"One of the biggest problems with software for pre-schoolers and learning-disabled children is keyboard input," he said. "The KoalaPad allows a child to use a program designed for his age level with *no* superfluous keys to confuse or frustrate him."

I told him that *Power/Play* likes to encourage kids to write software and asked what Koala's policy was on user-written programs. He said he thought the biggest mistake a company could make was *not* to encourage outside people to develop software for their products, and told me that users can order a programmer's package from Koala Technologies that will help them write programs for the pad. He mentioned that the company is very interested in any software that you might come up with and would like to see any finished programs with an eye toward marketing them!

In the course of our conversation I found out another very interesting fact about Dr. Thornburg—his first home computer was an original 8K PET 2001. He has been a Commodore user almost as long as there have been Commodore users, in other words.

When I asked him what new KoalaPad software we could expect to see in the near future, he enthusiastically told me about "LOGO Design Master", a program that lets Koala interact with LOGO. David said that even a very young child can use LOGO with the Design Master because the user enters the LOGO shape or design *first*, then the program creates the LOGO procedure (program code). He has even been using the KoalaPad (and Design Master) with a robot that interacts with LOGO. I was *green* with envy. (If you are interested in using LOGO on your Commodore 64, you'll be glad to hear that Dr. Thornburg has just written a book called *Computer Art and Animation: A User Guide for Commodore 64 LOGO.* The book, soon to be published by Addison Wesley, is one I know *our* family won't miss.)

The new Koala program that David didn't tell me about is *Paint-a-Rhyme.* He didn't tell me about it, he said, because he knew I would be going to the Winter Consumer Electronics Show in Las Vegas and he didn't want to spoil the fun he knew I would have discovering it for myself!

Paint-a-Rhyme is a magic coloring book for children that lets a child color favorite nursery rhymes with a paint program just as sophisticated as Koala Painter, but easier for non-readers to use and manipulate. When the picture is done, *Paint-a-Rhyme* plays the song that goes with the picture—Hickory Dickory Dock, etc. There is a menu choice that allows kids to enjoy the music all the time they're coloring.

If your child is new to coloring book art, he or she can choose to see the picture already colored. This feature might not seem impressive at first, but consider how children learn this type of skill—by example, of course. I have watched my five year-old, Molly, become the champion color-er of her kindergarten class—because she is constantly observing and imitating the techniques used by her seven year-old twin brothers Tim and James.

While *Paint-a-Rhyme* was being demonstrated my mind was filled with the memory of my (and now my children's) favorite childhood book—The Hobbit by J.R.R. Tolkien—and the marvelous magic toys the dwarves crafted for the Hobbit children after Bilbo Baggins' journey There and Back Again. I longed to be a child again, and share this "magic toy" with the lucky children who are growing up in our enchanted computer age.

I can safely say that the KoalaPad is one of the most innovative computer accessories for people of *all* ages that I have ever had the pleasure to connect to my Commodore 64. It lets, as I hoped it would, young children establish a good relationship with the computer where *they* are in control—not only of the computer, but of their own imagination and artistic abilities. After all, if you are old enough to imagine a wonderful, colorful screen with *round* balloons, *straight* roads, and *square* buildings, it's not fair to have to wait years to be able to create it just because your motor skills and hand-eye coordination haven't caught up with your inner vision. Artists like our friend Eddie Johnson feel that, with the

KoalaPad, they have discovered a whole new artistic world inside the Commodore 64—even artists who cannot program as much as a GOTO or IF/THEN.

Our family boasts a respectable collection of stuffed bears, some of which are said to be quite valuable. Koala is as stuffed with possibilities as any of the others are with kapok, and in the long run, may prove to be worth its weight in well-loved Teddies. We don't take it to bed with us, but we love it just the same. **C**

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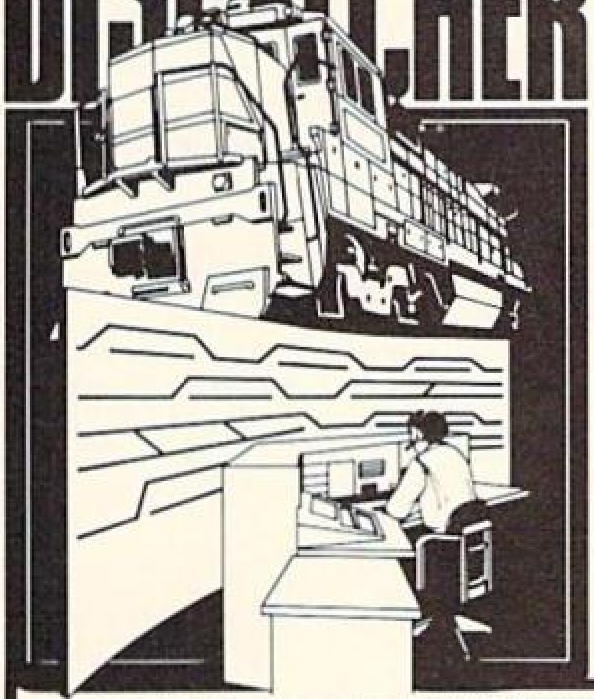

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VIC 20 How-To

by TJ Scimone

When you start programming your VIC 20, you'll probably begin with games. And that's a great way to start because it's an easy way to learn and you'll have fun along the way. There's only one problem with games: they usually involve lots of action. This action slows things down so you'll want to write your programs in an efficient way. That's what this article will help you do.

In most types of games you'll need to be able to put a figure on the screen and make it move. You are probably used to the formula:

POKE 7680 + H + V * 22, C

where H is the horizontal position, V is the vertical position and C is the character or figure you want to move.

This is sufficient in most cases but it takes up time, which slows your program down tremendously. The following program shows how you can control a character in a faster and more efficient method:

```
10 PRINT"[CLEAR,WHITE]":POKE
    36879,110:X=7910
15 FOR I=7680 TO 7701:POKE I,
   160:POKE I+484,160:NEXT
20 FOR I=7680 TO 8164 STEP 22:
   POKE I,160:POKE I+21,160
   :NEXT
25 FOR I=1 TO 100:POKE 7680+RND
   (1)*500,160:NEXT
```

These lines simply put a border around the screen and place a few obstacles here and there. The variable X is the position of your figure.

Now we get into the main part of the program:

```
30 A=PEEK(197):IF A=P THEN 55
35 P=A:IF A=48 THEN D=-22
40 IF A=33 THEN D=22
45 IF A=46 THEN D=-1
50 IF A=15 THEN D=1
```

Line 30 checks for the key pressed. If it's the same key that was pressed before it skips to line 55. Lines 35 through 50 assign a value to the variable D, depending on the direction you wish to move (i.e., north = −22[Q], south = 22 [Z], east = +1 [return], and west = −1 [=]).

```
55 IF PEEK(X+D)<>32 THEN 30
60 POKE X,32:X=X+D:POKE X,87
65 GOTO 30
```

Line 55 checks to see if the space you wish to move to is empty. If not, it goes back to check for another direction. Line 60 erases the old character, assigns X a new position by adding D(1, −1, 22 or −22) to it then puts your new character there. Then it does it all over again.

That's all there is to it. Type it in and try it out. (Use the keys "=," "return," "Q" and "Z" to move.)

The second part of any game requires figures to chase, destroy or get away from. This is what takes up a large amount of time so we need a fast method to make several characters move randomly around the screen. This is what routine number two does.

```
10 PRINT"[CLEAR,WHITE]":POKE
    36879,110
15 FOR I=7680 TO 7701:POKE I,
   160:POKE I+484,160:NEXT
20 FOR I=7680 TO 8164 STEP 22:
   POKE I,160:POKE I+21,160
   :NEXT
25 FOR I=1 TO 100:POKE 7680+RND
   (1)*500,160:NEXT
```

These four lines do the same thing as the first four lines in routine number one. They simply set up the screen.

```
30 D(0)=1:D(1)=-1:D(2)=-22:D
   (3)=22
35 FOR I=0 TO 3:X(I)=7910+
   (22*I):NEXT
```

Lines 30 and 35 initialize variables. Line 35 sets the positions of the characters to be moved.

```
40 I=I+1:IF I>3 THEN I=0
45 IF RND(1)<1 THEN 60
50 IF PEEK(X(I)+B(I))<>32 THEN 60
55 GOTO 65
60 B(I)=D(RND(1)*4)
```

Lines 40 through 60 pick a direction for one of the characters to move in. Line 40 decides which one of the four characters we are working with gets moved.

```
65 IF PEEK(X(I)+B(I))<>32
   THEN 60
70 POKE X(I),32:X(I)=X(I)+B
   (I):POKE X(I),81
75 GOTO 40
```

These lines make sure the direction picked is free of obstructions. If so, line 70 adds the correct variables to get the character in that space. Then it does it all over again.

That's all there is to it! The next program incorporates these two programs into an arcade-style game called *Ghost Town*. Simply type it in and run it. Using this as a foundation you should be writing your own programs in no time! **C**

TJ Scimone is a senior at Good Counsel High School, Wheaton, Maryland. He markets his own games and educational programs through his company, Oakly Software (P.O. Box 2124, Rockville, Maryland 20852). He also works part time for Reston Publishing Company.

Ghost Town, Part 1

VIC 20 and cassette only. *Type and save this part first. Then type and save Part 2 immediately after, with a slightly different name. When you run Part 1, it will automatically load Part 2.*

```
0 REM GHOST TOWN
1 REM BY TOM SCIMONE
2 REM P.O. BOX 2124
3 REM ROCKVILLE, MD.
4 REM 20852
10 POKE 52,28:POKE 56,28:POKE 36879,8
15 PRINT"[CLEAR,WHITE]"TAB(5)"GHOST[SPACE]TOWN[DOWN]"
20 PRINT"PICK[SPACE]UP[SPACE]THE[SPACE]GOLD[SPACE]AND
   [SPACE2]TRADE[SPACE]IT[SPACE]IN[SPACE]FOR[SPACE]
   EITHERCASH[SPACE]OR[SPACE]AMMUNITION."
25 PRINT"SHOOT[SPACE]THE[SPACE]ENEMY[SPACE]OR[SPACE]
   THEHAPPY[SPACE]FACE[SPACE]FOR[SPACE]BONUS.[SPACE]STAY
   [SPACE]CLEAR[SPACE]FROM[SPACE]THE"
30 PRINT"BIRD[SPACE]AND[SPACE]THE[SPACE]CACTUS.[SPACE2]
   WATCH[SPACE]OUT[SPACE]FOR[SPACE]THE[SPACE]BAD[SPACE]
   GUY...YOU[SPACE]NEVER[SPACE]KNOW"
35 PRINT"WHERE[SPACE]HE'LL[SPACE]RE-APPEAR!"
```

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```
36 PRINT"[DOWN]TRADE[SPACE]YOUR[SPACE]GOLD[SPACE]IN[SPACE]
   AT[SPACE]EITHER[SPACE]SIDE[SPACE]OF[SPACE]THE[SPACE4]
   GOLD[SPACE]SHOP[SPACE]OR[SPACE]THE[SPACE]AMMO[SPACE]
   SHOP."
40 FOR I=7168 TO 7679:POKE I,PEEK(I+25600):NEXT
45 FOR I=0 TO 143:READ A:POKE I+7168,A:NEXT
46 PRINT"[DOWN,RVS]HIT[SPACE]RETURN"
47 IF PEEK(197)<>15 THEN 47
50 PRINT"[CLEAR,DOWN]LOADING...[BLACK]";
55 CLR:POKE 198,0:POKE 198,9:POKE 631,76:POKE 632,79
   :POKE 633,65:POKE 634,68:POKE 635,13
56 POKE 636,82:POKE 637,85:POKE 638,78:POKE 639,13
60 END
1000 DATA 60,126,219,255,231,189,66,60
1005 DATA 56,124,56,16,124,146,56,68
1010 DATA 0,0,56,108,92,108,76,56
1015 DATA 255,248,247,247,244,246,248,255
1020 DATA 255,133,181,181,181,181,132,255
1025 DATA 255,231,235,235,235,235,39,255
1030 DATA 1,1,5,5,21,21,85,213
1035 DATA 85,85,85,85,85,85,85,85
1040 DATA 0,64,64,80,80,84,84,85
1045 DATA 255,255,206,181,181,133,181,255
1050 DATA 255,255,56,85,85,85,85,255
1055 DATA 255,255,231,91,91,91,101,255
1060 DATA 0,0,68,146,146,124,16,56
1065 DATA 24,24,219,219,255,24,24,24
1070 DATA 56,124,56,16,124,146,120,68
1075 DATA 0,0,0,0,0,0,0,0
1080 DATA 255,255,255,255,255,255,255,255
1085 DATA 0,0,24,60,24,0,0,0
```

Ghost Town, Part 2

```
0 S=36874:X=7910:C=30720:G=1:Y=7800:D1=1:V=5:POKE S-5,255
  :POKE S+5,8:POKE 37154,127
1 POKE S+4,15:DEF FN A(X)=INT(RND(1)*456)+7702
  :PRINT"[CLEAR,RED,DOWN,RIGHT14,DOWN]CDE[UP,LEFT3]FGH"
  :GOTO 20
13 P=INT(RND(1)*4)+1:IF P=1 THEN D1=1
15 IF P=2 THEN D1=-1
16 IF P=3 THEN D1=-22
```

```
17 IF P=4 THEN D1=22
18 RETURN
20 PRINT"[HOME,DOWN20,RIGHT4]IJK[UP,LEFT3]FGH[DOWN2,
   MAGENTA]
21 FOR I=7680 TO 7701:POKE I,16:POKE I+462,16:POKE I+C,3
   :POKE I+462+C,3:NEXT:FOR I=7680 TO 8142 STEP 22
   :POKE I,16
25 POKE I+21,16:POKE I+C,3:POKE I+21+C,3:NEXT
   :FOR I=1 TO 30:A=FN A(X):IF PEEK(A)=32 THEN POKE A,13
   :POKE A+C,5
30 NEXT:TI$="000000"
31 A$=STR$(V)
32 PRINT"[RVS]TIME[RVOFF]:"RIGHT$(TI$,2)"[RIGHT]"A$"[UP]"
   :D=0
34 A=(PEEK(37137)AND 28)OR(PEEK(37152)AND 128)
35 A=ABS((A-100)/4)-7
36 Q=PEEK(37137)AND 32
37 IF Q=0 THEN Q=11
38 IF A<>11 AND A<>3 AND A<>6 AND A<>5 THEN 60
39 IF A=11 THEN D=1
40 IF A=3 THEN D=-1
41 IF A=6 THEN D=-22
42 IF A=5 THEN D=22
43 IF Q=11 THEN 699
44 IF PEEK(X+D)=13 THEN 400
46 POKE X+C,0:POKE X,32
47 IF PEEK(X+D)=2 THEN POKE S,244:X=X+D:G1=1:GOTO 60
48 IF PEEK(X+D)=32 THEN X=X+D
49 IF RND(1)*10>2 THEN 60
50 POKE H,32
51 IF RND(1)*10>2 THEN 60
52 H=FN A(X)
53 IF PEEK(H)<>32 THEN 52
54 POKE H,0
60 POKE S,0
63 POKE X,1
64 POKE X+C,5+(G1*2)
65 IF VAL(TI$)>59 THEN 500
66 IF D<>0 THEN POKE S,128+A:POKE S,0
67 IF PEEK(197)=39 THEN 500
68 IF G<>1 THEN 70
69 IF FN A(X)<7742 THEN A=FN A(X):IF PEEK(A)=32 THEN POKE
    A,2:POKE A+C,7:G=0
70 IF X=7737 OR X=7741 THEN 100
```

```
71 IF X=8127 OR X=8123 THEN GOSUB 600
72 IF O=0 THEN 80
75 IF O=1 AND RND(1)>.10 THEN 94
76 D1=-1
77 O=0
78 Y=FN A(X)
79 IF PEEK(Y)<>32 THEN 76
80 IF PEEK(Y+D1)<>32 OR INT(RND(1)*10)<3 THEN GOSUB 13
81 GOTO 90
90 IF PEEK(Y+D1)=1 THEN POKE Y,14:GOTO 400
91 IF PEEK(Y+D1)=2 THEN G=1:POKE Y+D1,32:POKE Y,14
92 IF PEEK(Y+D1)=32 THEN Y=Y+D1:POKE Y-D1,32:POKE Y,14
94 IF FN A(X)<7766 AND G1=0 AND G=0 AND TI$<>A$THEN GOSUB
    430
95 GOTO 31
100 POKE Y,14:IF G1=1 THEN POKE S+1,244:FOR I=1 TO 50:NEXT
    :POKE S+1,0:G=1:G1=0
101 SC=SC+INT(RND(1)*200)+10
102 GOTO 72
400 A=99:DATA 56,124,56,16,124,146,56,68,0
401 POKE X,1:FOR I=1 TO 100:NEXT:FOR I=7176 TO 7183
    :POKE I,0:POKE S,128+A:A=A-1:FOR G=1 TO 200
410 NEXT G,I:POKE S,0:POKE X,32:RESTORE:FOR I=7176 TO 7184
    :READ A:POKE I,A:NEXT
420 FOR I=1 TO 200:NEXT:GOTO 500
430 A$=TI$:A=INT(RND(1)*19)+7681:U=255-(A-7681)
435 L=PEEK(A):POKE A,12:IF L=2 THEN L=32:G=1:G1=0:GOTO 440
437 IF L=1 THEN POKE S+1,0:GOTO 400
440 POKE S+1,U:POKE A,12:A=A+22:POKE A-22,L:U=U-1
450 IF A<8142 THEN 435
455 POKE S+1,0:TI$=A$:RETURN
500 RESTORE:FOR I=1 TO 7:READ A:NEXT
501 FOR I=1 TO 999:NEXT:POKE S+5,110
    :PRINT"[RVS,CLEAR,WHITE]YOU[SPACE]CASHED[SPACE]IN
    [SPACE]$[RVOFF]"SC:PRINT"[RVS,DOWN]WORTH[SPACE]OF
    [SPACE]GOLD.
510 PRINT"[RVS,DOWN]YOU[SPACE]SHOT[RVOFF]"W"[RVS]BAD
    [SPACE]GUYS.":SC=SC+(SC*2)+W*3:PRINT"[RVS,DOWN]SCORE
    :[RVOFF]"SC"[DOWN2]"
511 POKE S+4,10:READ P:IF P=-1 THEN POKE S+2,0:GOTO 513
512 READ A:POKE S+2,P:FOR I=1 TO A*30:NEXT:POKE S+2,0
    :GOTO 511
513 PRINT"[RVS,UP,RIGHT6,BLACK]GAME[SPACE]OVER"
    :FOR I=1 TO 99:IF PEEK(197)=39 THEN RUN
```

```
517 NEXT:PRINT"[RVS,UP,RIGHT6,YELLOW]GAME[SPACE]OVER"
    :FOR I=1 TO 99:IF PEEK(197)=39 THEN RUN
520 NEXT:GOTO 513
600 IF G1<>1 THEN RETURN
610 G1=0:D=5-V:A$=TI$:G=1:V=V+D:FOR I=1 TO D:POKE S+2,128
    :FOR A=1 TO 90:NEXT:POKE S+2,0:NEXT
630 TI$=A$:W=W+1:RETURN
699 V=V-1:IF V<0 THEN V=0:GOTO 60
700 POKE Y,14:FOR I=X+D TO X+(D*7)STEP D
701 IF PEEK(I)=0 THEN 900
702 IF PEEK(I)=14 THEN 800
703 IF PEEK(I)=2 THEN G=1:G1=0:GOTO 706
704 IF PEEK(I)<>32 THEN 710
706 POKE I-D,32:POKE X,1:POKE S+3,0:POKE I,17
    :FOR L=1 TO 15:NEXT:POKE S+3,128:NEXT
710 POKE S+3,0:POKE I-D,32:GOTO 60
800 POKE I-D,32:POKE S+3,0:D=255:FOR I=7368 TO 7376
    :POKE I,0:FOR A=1 TO 10:NEXT
801 POKE X,1:POKE S+2,D:D=D-15:NEXT:W=W+1:POKE S+2,0
    :POKE Y,32:Y=0:O=1:RESTORE
810 FOR I=7368 TO 7376:READ D:POKE I,D:POKE S,255:NEXT
    :POKE S,0:GOTO 60
900 POKE S+3,0:POKE I-D,32:POKE H,32:POKE Y,14:POKE S,244
    :FOR I=1 TO 200:NEXT:POKE S,0:SC=SC+20
901 GOTO 60
910 DATA 217,4,213,4,223,4,227,2,234,2,230,4,227,2,234,2,
    230,4,223,4,227,4,217,4,213,6,-1
```

Alpha Type

by Kevin Kostrzewa, age 13
Mt. Pleasant, Michigan

From Mt. Pleasant, Michigan, comes a fast action typing game with the best sound and graphics we have seen in a looong time. After a few rounds of *Alpha Type, everybody's* typing skills will improve. *Alpha Type* is easy enough for the youngest budding typist to use and enjoy, and provides exciting action and sound to satisfy all the jaded video experts who would like to be able to type their game program listings in with *super-speed!*

The programmer, Kevin Kostrzewa, talks about himself: "I had been working with computers for 11 months when I wrote *Alpha Type,*" he said. "I started out with a VIC 20, but after six months I felt I wanted a more powerful computer. That's when my parents bought me a Commodore 64." He continues, "I also enjoy playing the piano, (I've been playing for six years) and playing football."

Kevin goes on to describe the game: "In *Alpha Type,* you are stranded on Alpha Base in the Zarktow Sector, when suddenly—you are surrounded by four ships of the Evil Empire! As soon as the ships arrive, they begin firing at you. You realize that your only hope is to type the bomb's letter code before it hits your base.... but unfortunately, the better you do, the faster the Evil Empire ships fire!!"

Kevin's game has eight levels of difficulty, and instructions for play are included in the program. Good luck! People here (who shall remain nameless!) may be typing a million words a minute soon if they don't lay off playing Kevin's game and get back to work....... **C**

```
10 PRINT"[CLEAR,WHITE]"
   :POKE 53281,0:POKE 53280,7
   :DIM FP(1)
12 PRINT"[DOWN,SPACE13]
   ALPHA TYPE"
14 PRINT
16 PRINT"[SPACE17]BY"
18 PRINT
20 PRINT"[SPACE11]KEVIN KOSTRZEW
   A"
22 PRINT:PRINT
24 PRINT"[HOME,DOWN,SPACE4]
   DO YOU WANT INSTRUCTIONS? (Y/
   N)"
26 GET A$:IF A$=""THEN 26
28 IF A$="N"THEN 34
30 IF A$="Y"THEN 40
32 GOTO 24
34 INPUT"[HOME,DOWN,SPACE5]
   DIFFICULTY LEVEL (9-1)";A$
36 OP=VAL(A$):IF OP<1 OR OP>9 TH
   EN 36
38 FP=OP:GOTO 84
40 PRINT"[CLEAR,DOWN,SPACE4,RVS]
   DIFFICULTY LEVEL[RVOFF]
    DETERMINES HOW"
42 PRINT"[SPACE4]MANY HITS YOU C
   AN TAKE BEFORE "
44 PRINT"[SPACE4]YOU ARE DESTROY
   ED"
46 PRINT"[DOWN,SPACE4,RVS]
   TO PLAY[RVOFF]"
48 PRINT
50 PRINT"[SPACE4]YOU ARE STRANDE
   D ON ALPHA BASE"
52 PRINT"[SPACE4]IN THE ZARKTOW
   SECTOR WHEN YOU"
```

```
54 PRINT"[SPACE4]ARE SURROUNDED
   BY FOUR SHIPS OF"
56 PRINT"[SPACE4]THE EVIL EMPIRE
   .[SPACE2]AS QUICKLY"
58 PRINT"[SPACE4]AS THEY APPEAR
   THEY BEGIN TO"
60 PRINT"[SPACE4]HURL LETTER MIS
   SILES AT YOU.
62 PRINT"[SPACE4]YOUR ONLY DEFEN
   SE IS TO TYPE"
64 PRINT"[SPACE4]THE LETTER CODE
    BEFORE THEY "
66 PRINT"[SPACE4]HIT AND DESTROY
    YOUR SHIP.[SPACE2]THE"
68 PRINT"[SPACE4]MORE THAT YOU D
   ESTROY THE FASTER"
70 PRINT"[SPACE4]THEY COME AT YO
   U.[SPACE2]IS THERE "
72 PRINT"[SPACE4]ANY HOPE?????? "
74 PRINT
76 PRINT
78 PRINT"[SPACE10]PRESS ANY KEY"
80 GET A$:IF A$=""THEN 80
82 PRINT"[CLEAR]":GOTO 34
84 FL=0:FOR I=54272 TO 54296
   :POKE I,0:NEXT:PRINT CHR$(142
   );CHR$(8)
86 PRINT"[CLEAR]":POKE 53281,0
   :POKE 53280,1
88 POKE 54296,15:POKE 54277,100
   :POKE 54278,100:POKE 54273,100
   :POKE 54272,100
90 X(1)=1444:X(2)=X(1)+160
   :X(3)=X(1)+82:X(4)=X(1)+78
92 S(1)=1124:S(4)=1506:S(3)=1541
   :S(2)=1924
94 M(1)=40:M(2)=-40:M(3)=-1
   :M(4)=1
96 E(1)=1444:E(2)=E(1)+160
   :E(3)=E(1)+82:E(4)=E(1)+78
98 L2=1:LE=80:LV=100
```

```
100 GOSUB 170
102 I=INT(RND(1)*4)+1
    :S=INT(RND(1)*26)+1
104 XC=S(I)
106 GET AS:IF A$=""THEN A$=" "
108 XC=XC+M(I):POKE XC-M(I),32
110 IF XC=E(I)THEN 144
112 POKE XC,S:POKE XC+54272,1
114 FOR L=1 TO LE:NEXT
116 IF ASC(A$)<65 OR ASC(A$)>90
    THEN 120
118 POKE X(I),(ASC(A$)-64)+128
    :IF ASC(A$)-64=S THEN 126
120 READ A:IF A=-1 THEN RESTORE
    :GOTO 120
122 POKE 54276,16:POKE 54273,A
    :POKE 54276,17
124 GOTO 106
126 POKE XC,102:POKE 54276,129
    :FOR G=1 TO 50:NEXT
128 RESTORE
130 SC=SC+10:PRINT"[HOME,DOWN5,
    RIGHT7,RVS,CYAN]";SC
132 POKE X(I),160:POKE 54276,128
    :POKE XC,32
134 IF SC=LV THEN 140
136 REM     IFFL=3THEN540
138 GOTO 102
140 LV=LV+100:LE=LE-5:L2=L2+1
    :PRINT"[HOME,DOWN,RIGHT7,RVS]
    ";L2
142 FOR I=20 TO 1 STEP-1
    :POKE 54273,I*10
    :POKE 54276,33:NEXT:GOTO 102
144 FOR I=1 TO 10:POKE 53281,I*2
    :POKE 54273,I*5
146 POKE 54276,129:PRINT"[HOME,
    DOWN9,WHITE]"
148 FOR J=1 TO 100:NEXT:NEXT
    :FL=FL+1:IF FP>FL THEN POKE
    53281,0:GOTO 102
```

```
150 POKE 53281,0:POKE 54276,128
152 PRINT"[CLEAR,DOWN,SPACE11,
    RVS,CYAN,SPACE2]GAME[SPACE3]
    OVER[SPACE2,RVOFF]"
154 FOR I=15 TO 1 STEP-1
    :POKE 54273,I:POKE 54276,33
    :NEXT
156 POKE 54276,32
158 PRINT"[DOWN,SPACE10]
    YOUR SCORE WAS";SC
160 PRINT"[DOWN,SPACE6]
    DO YOU WISH TO PLAY AGAIN"
162 PRINT:PRINT"[SPACE16]Y / N"
164 GET A$:IF A$<>"Y"AND A$<>"N"
    THEN 164
166 IF A$="Y"THEN RUN
168 IF A$="N"THEN END
170 PRINT"[HOME,WHITE]";
172 PRINT"[RVS,SPACE16,RVOFF,
    SPACE3,CMDR *,CMDR +,
    SHFT POUND]"
174 PRINT"[RVS,SPACE2,CYAN]
    LEVEL 1[WHITE,SPACE7,RVOFF,
    SPACE4,SHFT Q]"
176 PRINT"[RVS,SPACE16]"
178 PRINT"[RVS,SPACE16]"
180 PRINT"[RVS,SPACE16]"
182 PRINT"[RVS,SPACE2,CYAN]
    SCORE 0[WHITE,SPACE7]"
184 PRINT"[RVS,SPACE16]"
186 PRINT"[RVS,SPACE16]"
188 PRINT"[DOWN,SPACE18,RVS,
    YELLOW,SHFT POUND,ORANGE]
    [WHITE] [ORANGE] [YELLOW,
    CMDR *]"
190 PRINT"[WHITE,RVS,CMDR *,
    RVOFF,SPACE17,RVS,ORANGE,
    SPACE2,WHITE,SHFT W,ORANGE,
    SPACE2]"
192 PRINT"[WHITE,CMDR +,SHFT Q,
    SPACE16,RVS,WHITE] [SHFT W,
    CMDR +,SHFT W] "
194 PRINT"[WHITE,SHFT POUND,
    SPACE17,RVS,ORANGE,SPACE2,
    WHITE,SHFT W,ORANGE,SPACE2]"
196 PRINT"[SPACE18,YELLOW,CMDR *,
    RVS,ORANGE] [WHITE] [ORANGE]
     [YELLOW,RVOFF,SHFT POUND]"
198 POKE 1543,102:POKE 1543+5427
    2,1
200 POKE 1583,95:POKE 1503,233
202 POKE 1503+54272,1
    :POKE 1583+54272,1
204 POKE 1542,81:POKE 1542+54272,
    1
206 POKE 1964,81:POKE 1964+54272,
    1:POKE 2004,102
    :POKE 2004+54272,1
208 POKE 2003,105+128
    :POKE 2003+54272,1
210 POKE 2005,95+128
    :POKE 2005+54272,1
212 RETURN
214 DATA 55,155,50,150,45,145,40,
    140,-1
```

So You Want to Eakspay Igpay Atinlay...

by Eddie Johnson

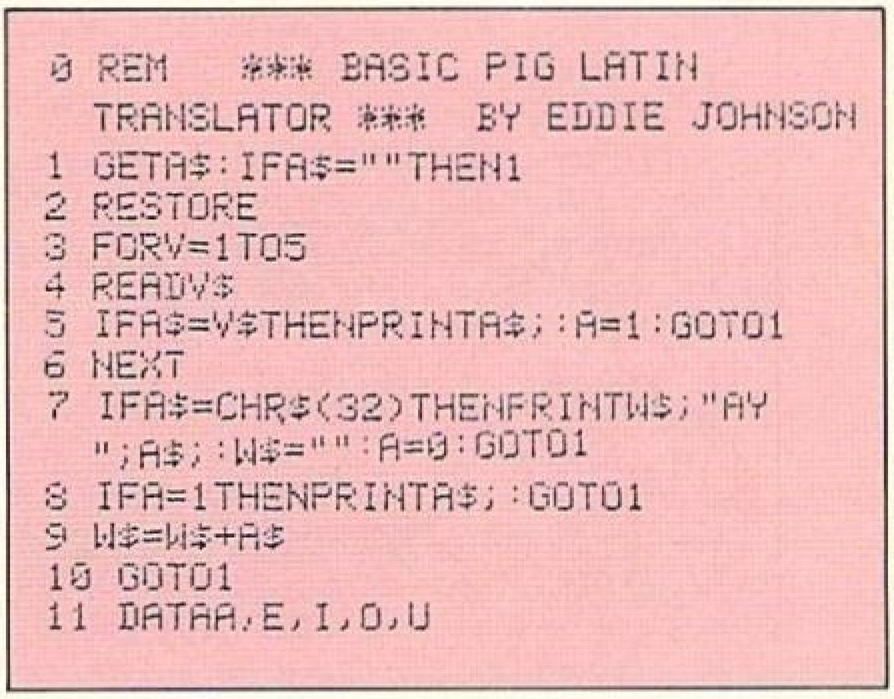
A utorialtay orfay the eginnerbay inguistlay.

The program below was discovered in my VIC 20 with the accompanying documentation. For those of you who may not be aware of one of New Mexico's least known and respected political figures, I have also included one of the very few extant photos of Dr. Petrie Curryfavor, Sociologist and Professor of Chaos. The photo was taken by Mary Ann Davidson during a telethon held last year by the Community Cable Channel, Albuquerque's public access T.V. station, at which time Dr. Curryfavor launched his mayoral, senatorial, gubernatorial and presidential campaign (as a "right-in" candidate). Amazingly enough, he did not receive a single vote! He later attributed this astonishing lack of support from the voting public to the fact that his campaign was announced on the eve of the elections after the polls had closed, and to the fact that there were no elections being held for two of the positions.

He then disappeared entirely from public view. In fact, the only evidence we have that he is still somewhere in the area is this silly little computer program. The professor's article was addressed to you at *Power/Play* so it's your baby now. The cassette does not appear to be booby-trapped. You may need it, so good luck!

p.s. I became intrigued by the idea of a BASIC Pig Latin translator program also, and wrote one myself (based on the Curryfavor program) to duplicate as nearly as possible the LOGO program in David Malmberg's article in the Summer, 1983, *Power/Play.* The result is the short program below. It runs with 321 bytes of RAM and fits into eleven lines (unless you count line 1 as two lines).

Editor's Note: We have included the venerable doctor's article just as it came to us. We claim no responsibility for spelling and punctuation errors and can say only, "Kids, don't use this as a model!"



```
0 REM    *** BASIC PIG LATIN
  TRANSLATOR ***  BY EDDIE JOHNSON
1 GETA$:IFA$=""THEN1
2 RESTORE
3 FORV=1TO5
4 READV$
5 IFA$=V$THENPRINTA$;:A=1:GOTO1
6 NEXT
7 IFA$=CHR$(32)THENPRINTW$;"AY
  ";A$;:W$="":A=0:GOTO1
8 IFA=1THENPRINTA$;:GOTO1
9 W$=W$+A$
10 GOTO1
11 DATAA,E,I,O,U
```

Dr. Curryfavor Writes

Hi there, EdiTor!

You are, No doubt, surPrised and Honored to be receiving a CommuniCation from the *eminent* and Famous Dr. Petrie Curryfavor, Are you Not? Of Course, you *Must* have *Realized* that you would *have* to hear from the World's LEADING CrypTologist and *leading* Practicioner of artiFicial Intelligence after issuing a Challenge like the one in your Summer Issue! I refer, Naturally, to the Challenge in David Malmberg's article on LOGO on page 55. He suggests that it would be Difficult for the Brilliant Dr. Curryfavor (who was *Not* mentioned by Name, for some reason, But we *all* Know who he Meant, don't we?) to write a BASIC proGram to Translate enGLish into Pig Latin (or igPay atinLay, as it is ProNounced by the Natives of omeRay).

So, without Reading any further, the canny Dr. C. hastened to the nearest unExpanded VIC 20 and wrote a program in BASIC that satisfied the Challenge, and then ReTurned to the Malmberg article.

Now although it *is* True that the three Tasks outLined on page 56, to Wit:

1. Determining if a word begins with a vowel

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2. Translating a single word
3. Translating a phrase with one or more words

are *Indeed* necessary to the accurate Translation of enGlish into igPay atinLay, it is Not True *enough!* There are *more* Tasks *yet* to be Done!

For Instance, someTimes the letter 'Y' is a consonant and *Some*times it is a Vowel—What do you Do about *THAT,* may I ask? And the letter Q *usually* needs the letter U to go *with* it, Doesn't it? Friendly old Dr. Curryfavor's CODE BOOK "IGPAY" takes Care of *all this* and MORE! The program makes funny little Noises while you Type and it *RINGS* a little Bell when you have only Five spaces left to the End of the line (Just like a *real* typeWriter)!

Also, it lets you select *any* Combination of letters for the End of your word So you can *also* write in Such languages as: igPop opBop, igPoa olonesian-Poa, or even igPibble ibberishGibble, for eXamples. Not only *that*, but the letters you seLect are entered *INVISIBLY* so that eNemy SPIES canNot see your Secret Code! In Addition, the program translates *while* you are typing the Message! After doing *all of this,* then the alTRUistic Dr. C. added Instructions and some interesTING Graphics and Sound Effects to Dress it Up and make it more Helpful.

Now Kindly old Dr. Curryfavor, Educator and Professor of Chaos, will show you How all of these MiraCulous Accomplishments were Accomplished!

Program Explanation

100: Initialize Variables for Sound, Screen/Border, etc.

110: Turn on VOlume, Color and clear Screen

120-240: IntroDuctory Graphics, Credits, Comments, InStructions.

250: Until you Press a Key, Line 250 puts a "Brake" on the program to let you take as much time as you Want to Read the Instructions.

260-280: CC$ is the "Color Change" string.

In Line 270, Clever old Dr. Curryfavor has changed the CHaRacter$ in CC$ into *numbers* for a Color Roll! He wanted a certain order of Colors to pass over the word "INVISIBLY!" (ending in RED—like the backGround—to make it INVISIBLE!). If you lOOk up the ASCII and CHR$ Number Codes for the CHaRacter$ in CC$ on Pages 145 through 147 in your *Personal Computing on the VIC 20*, and then SubTract 64 from each one, you will end Up with a Set of numbers from 0 to 15. This coResPonds to the 16 possible CHaRacter Colors. Line 270 beGins a Series of Nested LooPs which take Advantage of this Fact to allow us to write a Simple Formula to get one and two Digit Numbers in a specific Order without using DATA statements.

Since we are *already* using a DATA statement in Line 560, it Made it Difficult to put the CoLor codes in *anOther* DATA statement withOut conFusing the KomPuter, and since Dr. C. did Not want to have the Colors in Numerical Order, he Couldn't use a FOR... NEXT LooP or any other *SeQuential* numbering Routine. He *could* have put the CoLor Change into a SubRoutine with a Variable, but he would have Had to write *sixTeen* GOSUBs to Change the Color variable each time! *But,* your friend and Mine, Crafty ol' Dr. Curryfavor came Up with a couple of Interesting Formulae to Do the Job in Just *Three* lines (260-280)!

In Line 270, we first initiate a FOR... NEXT LooP: FOR C=1 TO 16 THIS will take us through the SiXteen CoLor Changes. Now for the First of Dr. C.'s Magic Formulae:

```
CL$=MID$(CC$,C,1)
```

Each time through the 'C' LooP, the KomPuter will seLect *One* of our CHaRacter$ from CC$, starting from the *Left* (the 'C' is our CoLor Counter from the FOR C... NEXT C LooP, and the '1' means it Selects only *One* CHaRacter at a time). Now for Magic Formula Number Two:

```
CL=ASC(CL$)−64
```

This changes the *CHaRacter* into a *Number* from 0 to 15—The 'ASC(CL$)' conVerts the CHaRacter to its ASCII Code Number, and the '−64' turns it into a Number beTween 0 and 15. For eXample, if C=1, then CL$='A' and ThereFore:

```
ASC('A')=65: 65−64=1: 1=WHITE
```

In Line 280 We find: FOR R=38736 TO 38746. This beGins the Second LooP (which is Nested in the "C" LooP). The Numbers are Addresses on the COLOR CODES MEMORY MAP (see Page 144 in your *Personal Computing on the VIC 20* book) which hold the letters for the word "INVISIBLY!". Now, we POKE R, CL to Change the Color of the First letter (I) to the First CoLor of CL (WHITE). To Slow Down the action a little Bit, Dr. C. has put in a Time deLay LooP nested inside the 'R' LooP: FOR T=1 TO 30: NEXT (the NEXT is "NEXT T").

The *next* "NEXT" is really "NEXT R", and *it* Goes back to the "FOR R" to CoLor the NEXT Letter (N), and So on until All the letters in the word "INVISIBLY!" are CoLored with the First CL (WHITE). *Then* we Come to the *next* "NEXT", which is "NEXT C". This sends us *Back* to Line 270 to get the NEXT CoLor for the CoLor Roll (YELLOW):

ASC('G')=71: 71−64=7: 7=YELLOW

Then we go through the R lOOp *aGain* to CoLor All the Letters YELLOW! And so Forth until *All* 16 CoLors have Been used and the word "INVISIBLY" has *Vanished* (RED on RED, REMember?).

290: After the Word "INVISIBLY!" disAppears, we pause for a second.

300: This RouTine is *Fun!* The Numbers 128 TO 254 rePresent the Range of Pitches in the Sound Generators (128 is the lowesT Note, and 254 is the Highest notE minus one). POKE S4, L POKEs the NotE L into the white Noise generator (S4). PRINT adds a blank Line to the bottoM of the DispLay each Time through the LooP, and this Scrolls the writing off the tOp of the page.

You may try substiTUTing S1, S2, or S3 to get Different sounds (Dr. Curryfavor doesn't Mind!). SomeTime maybe Generous old Dr. Curryfavor will show you How *he* uses this Method in a Utility SUBroutine to maniPulate different Kinds of display Screens in Different ways.

320-330: Here is Where you Enter your Secret Code word Ending (if you want to write in Standard igpAY atinlAY, type in "AY"). Dr. C. got a little FanCy here. First we PRINT "AND PRESS <RETURN>" at SPC(46)—This puts it on the *Third* Line. When we INPUT "SELECT WORD ENDING", the ReVerSe S puts this line at the toP of the Screen, *above* the first line (you get the ReVerSe S by tyPing "HOME"). The letters Entered BeCome AY$. The ReVerSe E at the enD PRINTs your letters in WHITE, and thereFore INVISIBLY! (The ReVerSe E is CTRL WHITE).

340: Here we Take the LENgth of AY$ and call it "AY". BL is a counter for the Margin BeLL and since AY$ will be added at the *End* of the word, WE will add in its LENgth at the *beGinning*, So that we won't run Out of Space to PRINT it. If your word is too Long, you may HY-PHENate it and hit <RETURN>, and then ConTinue. IF your word Ends at the eNd of the Line, or if there is Only One sPace left, Do NOT hit <RETURN> or you will Skip a Line.

350: Just Tells you What to Do Next.

360: Here is Where the Main program *Really* Starts! We are Waiting for your First Letter! Hurry UP, now!

370: As soon as you eNter a letter, our BeLL counter adds a 1. But you won't SEE *any-Thing* on the Screen until you type a *Vowel*.

380: This is the Place to RESTORE the DATA from Line 560 (our List of Vowels)—beTWeen the GET A$ (which Gives us the First letters in the word), and the Vowel Checker in Lines 410-430.

390-400: These Two lines take Care of Special Cases—Line 390 makes Sure that the U stays with the Q if the Q is Going to be moVed to the End of the Word. *Other*Wise they will be Treated Normally. If the Q is followed by any *Other* letter, this Line will be IgNored. Line 400 will Treat Y as a ConSonant *if* it Comes at the *BeGinning* of a word (IF Y=1, AND our FIRST letter (A$) is a Y, THEN we jumP Over the Vowel Checker in Lines 410-430). If Y=0, THEN Y will be Treated as a *Vowel*.

410-430: *Now* we Find Out if A$ (your First letter in the word) is a Vowel. The FOR V… NEXT V LooP READs the six Vowels in Line 560 and ComPares them to A$. IF A$=V$ THEN it is a Vowel, So we PRINT it and GOSUB to 530 for a Sound Effect and THEN GOTO 480 for the next GET statement.

440: BeCause Y *now* equals 0, From this Point on, Y will be Treated as a Vowel *until* the End of the word.

450: This Line means IF you Hit <RETURN>—CHR$(13)—THEN our BeLL counter Goes back to the LENgth of AY$ (your Secret Syllable(s)). We THEN PRINT A$. Since our First CHaRacter is <RETURN> and our Next word Might start with Y, we have to turn it Back into a ConSonant (Y=1). BO is our Bell switch—On or Off. In Line 590 BO beComes eQual to 1, which preVents it from Being Rung aGain *until* you get onto the next Line (Study the IF… THEN statement in Line 540 and lOOk at Lines 490, 500 and 590). And THEN we GO back TO the BeGinning of the Main Program at Line 360 to GET the *next* letter.

460: IF the First letter in the Word is Q THEN Q=1, so that in Line 390 we can jUMp oVEr the Vowel Checker in Lines 410 to 430. *This* way, if our Q is followed by a U (IF A$=U), THEN we GO TO Line 440 and in Line 470, we Add the U to W$ (our Initial ConSonant(s)). *And*, at the same Time, Q words with*Out* U's (like QATAR) will be treated Normally.

470: Here we ConCatenate the Initial Letters of the word Until we find our *First* Vowel. W$ keeps Adding A$'s to ItSelf withOut PRINTing them *unTil* the <SPACE> Bar is Hit (see Line 510). This means we can Turn words like SCHLEP into words like EPSCHLAY. Again we GOSUB to our Sound Effect at 530, and GOTO the beGinning for the Next A$ eNtry.

480: IF we have PRINTed our First Vowel in Line 420, we Come Up *Here* for the *Rest* of the word. B$ doesn't Care at All Whether the letter is a Vowel or a ConSonant or a HyPhen, it will Treat them all the Same.

490: You Just Hit a letter, so now our BeLL counter adds One to ItSelf. IF this makes it *More* than 22 (the Maximum VIC 20 Line length, THEN we set it Back to AY PLUS the Number of Initial ConsoNants, if any (LEN(W$)), and we re-Enable the BeLL (BO=0). REMember, *Don't* Hit <RETURN> if you are at the End of the Line—just Keep Typing.

500: Just like Line 450. IF we <RETURN>, we re-Set our BeLL counter (BL=AY) and our BeLL switch (BO=0).

510: OKAY! Our First word is Typed, and we Hit the <SPACE> Bar (CHR$(32)). *NOW* we PRINT W$ (our Initial ConSonant(s), if any); Followed by our Secret Code (AY$); and the *lasT* CHaRacter typed (B$)—in This Case, the <SPACE>. We *also* Make it Possible for the Y to be a ConSonant again (Y=1). We eMpTy Out W$ (so we can put More A$'s into it if we have to), we Allow Q and U to stay ToGetHer if they Come at the BeGinning of a word (Q=0); we Put our BeLL Counter back to AY, we GOSUB to our Sound Effect and GOTO the Beginning for the next letter.

520: If we Hit any Key *eXcept* the <SPACE> or <RETURN>, we come Here to PRINT it, make our Sound Effect and GO back TO 490 for the next Letter.

530: This is the KEY KLIK Sound Effect. 1OOks Pretty Easy to Me.

540: This is our MarGin BeLL Checker—right After *eVery* entry we Check to See IF we are withIn fiVe spaces of the End of the Line (we are incluDING the "InVisible" letters in AY$) and IF so, we GOSUB 570 for the BeLL SUBroutine.

550: Now we get RETURNed to Right After the GOSUB that GOt us Here.

560: DATA statements can Go *any*Where in a Program. Cautious ol' Dr. C. put his Here to seParate the two Sound Effect SUBroutines beCause it made them Easier to Tell aPart while he was Working on them.

570-590: So you ProBably Guessed that *this* is

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our typeWriter BeLL! It is a Pretty Simple routine, but Particular old Dr. Curryfavor Spent a *Lot* Of Time with the Numbers to Try to Find just the Right Sound. Do you See the "Trill" in Line 570? And the VOlume Fade-Out in Line 580? Line 590 DisAbles the BeLL and RETURNs us to WherEver we Came from (no Jokes, Please!).

So now we Have a DanDy little SECRET CODE BOOK with Which we can write Messages in a Lot of Different Languages. In *Fact,* you could *Even* use "IGPAY" for a Game for two people—one Person types in a Code and a MESSage and the Other one tries to deCipher it! What Fun!

SomeDay Soon, HardWorking old Dr. Curryfavor will Send in a ProGram with a *SECRET* KEY and a PASSWORD, and a *Special DeCoder Routine* that he is Working on! *Then* you will be Able to Send your SeCret MESSages on TAPE to *other* Secret Agents or *even* to Kindly old Dr. Curryfavor, Him*Self*!!

Dr. Petrie Curryfavor,
Professor of Chaos.

Not Only *That*, but *also* in the Works are a series of KOMPUTER CODE BOOKS, CryptoGram Games, and some *other* Dirty Tricks from Dr. Curryfavor's Chaos Parlor and KomPuter Club!

Now, if you would Like to Avoid typing this ProGram into your KomPuter *yourSelf*, you May send a Blank Tape, a Self-Addressed, Self-Stamped mailer, and $3.00 to:

Dr. Petrie Curryfavor
c/o Eddie Johnson
2928 Tennessee NE
Albuquerque, NM 87110

Checks and Money Orders should be made Out to Eddie Johnson. They won't let Poor Harmless old Dr. Curryfavor in the Bank any More! *And* if you have *Any* Questions about the ProGram—or *Any*-Thing Else, for *that* Matter, you May call the World's ForeMost *EX*pert, Dr. Petrie Curryfavor, at: (505) 299-1662. **C**

Bye, Bye for Now,
from Your Friend and Mine,
Dr. Petrie Curryfavor
Dr. Petrie Curryfavor,
CyberCryptographer and
Professor of Chaos

Curryfavor's Pig Latin

```
100 S1=36874:S2=S1+1:S3=S2+1:S4=S3+1:VO=S4+1:SB=VO+1:W$=""
    :Y=1
110 POKE VO,15:POKE SB,47:PRINT"[CLEAR]"
120 PRINT SPC(6)"[YELLOW]TOP[SPACE]SECRET"SPC(34)"[WHITE]
    EYES[SPACE2]ONLY"
130 PRINT SPC(94);"[CYAN]CODE[SPACE2]BOOK"SPC(35)"[YELLOW]
    'IGPAY'"
140 PRINT SPC(181)"[MAGENTA](DON'T[SPACE]TELL)"
150 FOR T=1 TO 5000:NEXT:PRINT"[CLEAR]":FOR T=1 TO 2000
    :NEXT
160 PRINT"[HOME,YELLOW,RVS,SPACE8]IGPAY:[SPACE8]"
170 PRINT SPC(49)"[CYAN]ENCRYPTED[SPACE]BY"SPC(71)"[GREEN]
    DR.[SPACE]PETRIE[SPACE]CURRYFAVOR,"
180 PRINT SPC(46)"[CYAN]CRYPTOGRAPHER[SPACE2]
    AND"SPC(26)"PROFESSOR[SPACE]OF[SPACE2]CHAOS"
190 FOR T=1 TO 9000:NEXT:PRINT"[CLEAR]":FOR T=1 TO 2000
    :NEXT
200 PRINT"[HOME,YELLOW,RVS,SPACE8]IGPAY:[SPACE8]"
210 PRINT"[DOWN,CYAN,SPACE3]AS[SPACE]SECRET[SPACE]AGENT,"
    :PRINT"[DOWN,SPACE]YOU[SPACE]WILL[SPACE]BE[SPACE]
    REQUIRED"
220 PRINT"[DOWN,SPACE2]TO[SPACE]SELECT[SPACE]YOUR[SPACE]
    OWN":PRINT"[DOWN,SPACE2]CODED[SPACE]WORD[SPACE]
    ENDING."
230 PRINT"[DOWN,SPACE2]IT[SPACE]WILL[SPACE]BE[SPACE]
    ENTERED":PRINT"[DOWN,SPACE3]INTO[SPACE]THE[SPACE]
    PROGRAM"
240 PRINT"[DOWN,SPACE6]INVISIBLY!"SPC(94)"[MAGENTA]PRESS
    [SPACE]ANY[SPACE]KEY[SPACE]TO[SPACE]BEGIN"
250 GET G$:IF G$=""THEN 250
260 CC$="AGCEDF@HIJKLMNOB"
270 FOR C=1 TO 16:CL$=MID$(CC$,C,1):CL=ASC(CL$)-64
280 FOR R=38736 TO 38746:POKE R,CL:FOR T=1 TO 30:NEXT:NEXT
    :NEXT
290 FOR T=1 TO 1000:NEXT
300 FOR L=128 TO 254 STEP 2:POKE S4,L:PRINT:NEXT:POKE S4,0
310 FOR T=1 TO 1000:NEXT
320 POKE SB,27:PRINT"[CLEAR]"SPC(46)"[BLUE]AND[SPACE]
    PRESS[SPACE,RVS,RED]<RETURN>[RVOFF]"
330 INPUT"[HOME,BLUE,SPACE2]SELECT[SPACE]WORD[SPACE]
    ENDING[WHITE]";AY$
340 AY=LEN(AY$):BL=AY
```

```
350 PRINT"[CLEAR,BLUE]TYPE[SPACE]A[SPACE]WORD[SPACE]AND
    [SPACE,RVS,RED]SPACE[RVOFF,BLUE]:[DOWN]"
360 GET A$:IF A$=""THEN 360
370 BL=BL+1
380 RESTORE
390 IF Q=1 AND A$="U"THEN 440
400 IF Y=1 AND A$="Y"THEN 440
410 FOR V=1 TO 6:READ V$
420 IF A$=V$THEN PRINT A$;:GOSUB 530:GOTO 480
430 NEXT V
440 Y=0
450 IF A$=CHR$(13)THEN BL=AY:PRINT A$;:Y=1:BO=0:GOTO 360
460 IF A$="Q"THEN Q=1
470 W$=W$+A$:GOSUB 530:GOTO 360
480 GET B$:IF B$=""THEN 480
490 BL=BL+1:IF BL>22 THEN BL=AY+LEN(W$):BO=0
500 IF B$=CHR$(13)THEN BL=AY+LEN(W$):BO=0
510 IF B$=CHR$(32)THEN PRINT W$;AY$;B$;:Y=1:W$="":Q=0
    :BL=BL+AY:GOSUB 530:GOTO 360
520 PRINT B$;:GOSUB 530:GOTO 480
530 FOR K=1 TO 5:POKE S4,INT(RND(1)*75)+180:NEXT:POKE S4,0
    :REM KEY KLIK
540 IF BL>16 AND BO=0 THEN GOSUB 570
550 RETURN
560 DATA A,E,I,O,U,Y
570 FOR B=1 TO 20:POKE S3,249:POKE S2,252:POKE S3,254:NEXT
    :REM BELL
580 FOR B=15 TO 0 STEP-.5:POKE VO,B:NEXT:POKE S3,0
    :POKE S2,0:POKE VO,15
590 BO=1:RETURN
```

How to Submit Things to Kids' Corner

Programs: *Must* be sent on disk or tape, clearly marked with computer type and your name, address, and PHONE NUMBER. If your program is for the VIC, mark the label with the amount of memory you had plugged in when you saved the program. Send a printout (listing) if you can, and BE SURE that your disk or tape is mailed in a PADDED protective envelope. Tapes should be in a mailing case, disks between two pieces of stiff cardboard. Protective envelopes are found at office supply stores for around 25 cents. They're worth it!

Articles, Stories, Poems, etc.: Should be typed or computer printed, double spaced, each page numbered, and headed with the title and author's name, address, and phone number. I can, if absolutely necessary, accept text that is neatly hand printed on every other line, each page numbered and headed as described above.

Photographs: Color or black and white, preferably 35mm. Taped or otherwise attached to a stiff piece of paper or cardboard (but make sure they can be removed without damaging them). Label the paper with some type of caption, the name(s) of the person(s) pictured, and the name, address, and phone number of the sender. (School pictures are just fine.)

Drawings: Black and white might be best; at least outline things in a dark color if you can. Make them big enough that details will show if they have to be reduced. If you are sending a cartoon, print the captions in the balloons very carefully, or get someone who is really good at printing to do the words for you. Mail them using the same directions as for photographs.

If you are sending a program, don't forget to include the directions! It's a good idea to have them right in the program if you can. Be sure to keep a copy of everything you send. I might need to call you about it, and unfortunately, I can't send anything back. If you have already sent something in and didn't see it in this issue, remember that we have to get *Power/Play* ready for printing almost THREE months before you read it! If something you sent is going to be in the magazine, you will probably get a phone call from me before you see it in print so don't forget to include your AREA CODE and phone number.

Even if you are sending a drawing, photo or program, write something that tells a little bit about YOU. Don't forget to send a picture of yourself!

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Computer Searchword

by John Young

In a minimum of microseconds see if you can retrieve 28 relevant words from storage in our computer searchword! Answer key is on page 128.

```
A  E  F  O  R  M  A  T  T  P  O  O  L
M  C  V  C  I  C  E  U  M  R  E  P  Y
E  A  J  I  C  N  N  R  O  I  B  O  F
G  E  N  E  R  A  T  I  O  N  C  T  I
D  F  S  I  E  D  T  E  R  T  X  R  D
I  S  Y  P  P  O  L  F  G  E  S  S  O
R  E  S  P  A  U  E  U  T  R  P  O  M
T  S  T  R  D  L  L  E  C  E  A  F  U
R  R  E  O  E  P  O  A  E  D  A  T  A
A  U  M  G  Y  R  S  D  T  O  F  W  E
C  H  B  R  U  P  N  N  D  E  R  A  E
D  T  H  A  A  L  O  C  O  T  O  R  P
Y  R  O  M  E  M  C  C  N  N  I  E  V
```

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Eight-Creator

by Richard Winters

Create, define, view and retrieve data for up to eight sprites on your Commodore 64 using this short program. It's based on the Sprite Creator by Tim Villanueva that appeared in our Summer, 1983, issue.

Eight-Creator

```
20 SN=0
30 FOR F=12288 TO 12798
   :POKE F,255:NEXT F
40 PRINT CHR$(147);
50 POKE 53280,0:POKE 53281,0
60 FOR T=1 TO 21:PRINT"[WHITE]..,
   ,..,,..,,..,,..,,..,,":NEXT
70 PRINT"GOTO200:REM[RVS]
    CREATE SPRITE [RVOFF]"
   :PRINT"GOTO300:REM[RVS]
    GET DATA [RVOFF]"
80 PRINT"[HOME,DOWN21]"
90 V=53248:POKE V+21,255
   :FOR F=0 TO 7:POKE(V+39+F),1
   :NEXT
100 FOR F=0 TO 6 STEP 2
    :POKE V+F,250:POKE V+F+8,43
    :NEXT:POKE V+16,240
110 POKE V+1,50:POKE V+3,98
    :POKE V+5,146:POKE V+7,194
120 POKE V+9,50:POKE V+11,98
    :POKE V+13,146:POKE V+15,194
130 FOR F=0 TO 7:POKE(2040+F),
    192+F:NEXT
140 END
200 C=8:G=0
210 FOR Y=0 TO 20
220 FOR X=1 TO 24
230 P=PEEK(1023+X+40*Y)
240 C=C-1:IF P=42 THEN Q=Q+2^C
250 AD=SN*64+12288+G
260 IF C=0 THEN C=8:G=G+1
    :POKE AD,Q:Q=0
270 NEXT X
280 NEXT Y
290 END
300 PRINT CHR$(147):PRINT:PRINT
310 FOR T=0 TO 62
320 PRINT PEEK(SN*64+12288+T),
330 K=K+1:IF K=3 THEN K=0:PRINT
340 NEXT
350 SN=SN+1
360 GET A$:IF A$=""THEN GOTO 360
370 IF A$="R"THEN GOTO 400
380 GOTO 40
390 END
400 PRINT CHR$(147)
410 POKE 53269,0
420 INPUT"WHICH SPRITE DO REQUIR
    E DATA FOR";SN:PRINT
430 GOTO 310
440 END
```

Instructions

1. Enter or Load the program: Load"EIGHT-CREATOR".
2. RUN the program.
3. Move the cursor onto the grid that appears on the screen.
   Warning: Be sure not to immediately move the cursor down as this moves the grid off the screen and you will have to re-RUN the program.
4. CREATE the desired shape of your sprite on the grid with asterisks.
5. When you have achieved the desired shape, move the cursor to the line below the grid that reads "GOTO200:REM CREATE SPRITE" and press RETURN.
6. The VIEW of the sprite will appear in the appropriate section.
7. If you are pleased with the sprite, then you can move the cursor to the second line below the grid that reads "GOTO 300:REM GET DATA" and press RETURN. This will simultaneously DEFINE the sprite and display the composite data for that sprite. While in this mode you can RETRIEVE DATA for any previously DEFINED sprite by pressing the "R" key. To return to the CREATE mode, simply press any other key.
8. If you are not pleased with the sprite, then move the cursor back up into the grid to RECREATE the sprite. To do this simply put an asterisk where you wish. To delete an asterisk, replace it with the appropriate symbol—a comma or a period.
9. **Note:** The sprite VIEW sections appear on the screen in the following pairs: (0,4) (1,5) (2,6) (3,7).
10. If the programmer wishes to VIEW enlarged sprite displays, the following lines can be added:

```
10 POKE 53271,255:POKE 53277,255
```

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Program Pizzaz

by James R. Miller

Title tricks add zest to programs for the VIC 20.

Like a great lead to a magazine story, program titles can lend luster to dull but functional programs. Even the most inventive program structure may otherwise present material in a way that invokes little more than a yawn from friends who try out your programs on their own machines.

As an editor for many years, I was confounded often by very competent writers who wrote lead paragraphs that were about as effective as a tranquilizer. I was certain that whatever followed was accurate and complete, but the lead didn't make me want to read the rest of the story.

Consider program titles as the lead to your game or other programs and remember that a few simple tricks can make good programs even better, more interesting and exciting.

On many computers using Microsoft BASIC, for instance, you can design titles or instructions that march across the screen, appearing magically at the right edge and dancing off the left edge accompanied by sound effects.

With another simple subroutine, you can turn your computer into a simulated electronic tele-type machine, spitting out words a letter at a time, rapidly followed by bells and tele-type key chatter.

And with the VIC 20 and its video chip, you can drop the whole screen off your monitor and pull it up again with your title in place, printed "off-screen" as if by magic! With a few well placed POKEs, you can also "wipe the slate clean" and present new material in its place.

Included on page 107 are a few easy program subroutines that will put a little pizzaz in your titles and add zest to that favorite computer creation.

One Moment, Please . . .

This little eye-catcher works with the VIC 20 alone, with its special Video Interface Chip, which is where Commodore got the name for VIC. Locations 36864 and 36865 control the screen position on your TV or monitor. By POKEing other than normal values into the 36865 address, for example, you can make the VIC screen bob up and down or vanish completely.

When you switch on the VIC, the screen location for vertical centering is at 36865,25. POKEing a higher value will drop the screen down until by 36865,150 it looks as though there is no screen at all. Enter a direct command into your VIC—POKE 36865,150—and watch what happens. Pressing the RUN/STOP and RESTORE keys will return the screen to normal.

In the subroutine in lines 100 to 170, the trick is to drop the screen off the monitor with a FOR/NEXT loop, print a title while the screen has "vanished" and then return the screen to normal, title in place. As little as nine lines will do the trick. You can use any title you like, mine is only an example.

You can run this subroutine as it is listed, but you will get an ERROR message "RETURN WITHOUT GOSUB". Don't worry about it; the listing is for a subroutine in a program, and there will not be any error with the proper GOSUB.

A simple modification will slow down the "sliding" screen effect for a smoother presentation. That's done with a short delay loop after lines 130 and 160. I leave it to you to figure that out. . . but beware of your "nesting".

Messages on the March

Another simple subroutine will "march" messages across the screen like alphabetic soldiers. A little delay loop determines how quickly the "soldiers" march.

This routine uses data statements, which are read a letter at a time. Some care must be exercised in typing the data statements because every letter and every space needs a comma following, except at the end of a data line.

This routine begins at line 200 to allow you to add it easily to the first subroutine above and combine the "sliding" screen effect with the "marching message."

Line 300 includes 21 comma-space units after the last letter to insure that all the message moves off screen before your program returns to the main section.

Line 250 is the delay loop that controls how quickly the message moves across the screen and line 230 determines where on the screen the message will appear. You can place it anywhere you like.

Line 200 clears the screen of any previous message or text, but you can delete the {CLR} command and combine stationary and moving text together on the screen. Just make sure they are not printed on the same screen rows.

Teletype Text

One other simple (and very short) routine can turn your computer screen into a simulated teletype machine that will print out messages a letter at a time just as though some unseen hands were tapping on the keys.

The teletype routine itself is only three lines long, from 400 to 410.

Rather than print text in the usual manner using the PRINT statement, this routine prints every

VIC Title Tricks

```
10 PRINT"[CLEAR]"
20 PRINT"[BLACK]TITLE TEASERS
   [BLUE]"
30 GOSUB 100
40 GOSUB 200
50 GOSUB 400
60 PRINT"[CLEAR]"
70 T$="[DOWN,BLACK]
   YOUR COMPUTER CAN":GOSUB 400
75 T$="[DOWN]PRINT WORDS LIKE TE
   LE-":GOSUB 400
80 T$="TYPEWRITERS WITH SOUND"
   :GOSUB 400
85 T$="TO ADD EXCITEMENT TO"
   :GOSUB 400
90 T$="[DOWN]YOUR PROGRAMS!!"
   :GOSUB 400
92 FOR J=1 TO 1000:NEXT
95 T$="[DOWN2,RIGHT8]
   THANK YOU!!!":GOSUB 400
96 FOR J=1 TO 1500:NEXT
   :PRINT"[BLUE]":GOSUB 100
99 END
100 PRINT"[CLEAR]"
110 PRINT"ONE MOMENT PLEASE..."
120 FOR J=1 TO 1000:NEXT
130 FOR SD=25 TO 150
    :POKE 36865,SD:NEXT SD
140 PRINT"[CLEAR]"
145 FOR J=1 TO 1000:NEXT
150 PRINT"[HOME,DOWN10,RIGHT3,
    RVS]VIC TITLE SCREEN![RVOFF]"
160 FOR SU=150 TO 25 STEP-1
    :POKE 36865,SU:NEXT SU
165 FOR J=1 TO 2000:NEXT
170 RETURN
200 PRINT"[CLEAR]"
210 READ WS$
220 IF WS$="-1"THEN RETURN
230 PRINT"[HOME,DOWN3]"
240 PRINT TAB(20)"";WS$
    :PRINT"[LEFT21]";CHR$(20)
    :REM INSERT/DELETE
250 FOR J=1 TO 200:NEXT
260 GOTO 210
270 REM MESSAGE DATA
280 DATA V,I,C, ,T,I,T,L,E,S
290 DATA ,C,A,N, ,B,E, ,F,U,N,!
300 DATA ,T,R,Y, ,Y,O,U,R, ,O,W,
    N,.., , , , , , , , , , , , ,
     , , , , , , , ,-1
310 END
400 FOR I=1 TO LEN(T$)
    :PRINT MID$(T$,I,1);
405 POKE 36878,15:FOR M=240 TO 2
    50 STEP 10:POKE 36875,M
    :NEXT M:POKE 36878,0
    :POKE 36875,0
410 FOR D=1 TO 30:NEXT:NEXT:PRINT
    :RETURN
```

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letter and space in the T$ string of your choice.

To make use of this routine, selected program lines must use the following format:

Line (xx) T$ = "ANY LINE OF TEXT": GOSUB 400

The use of many such lines will require a lot of memory, but for brief instructions and program prompts the technique is very effective, especially when used with a short sound routine. Cursor controls and reverse-field commands also can be included in the T$ string with the same results you would expect from the ordinary PRINT command.

The addition of a short sound routine (line 405) inside this subroutine will produce sounds like a teletype machine and give the technique added authenticity.

The final program on page 107 puts all of the routines together into a short title program that will give you an idea of how they all work together.

NOTE TO BEGINNING PROGRAMMERS: The first two programs will run as they are written but produce an ERROR message after the run. The ERROR is "RETURN WITHOUT GOSUB" and it comes up because there is no "program" for the routine to RETURN to.

The addition of a few temporary lines will freeze the display without the ERROR message. For example, in program one temporarily add line 10 GOSUB 100 and line 20 GOTO 20 to hold the display on the screen. C

Zodiac

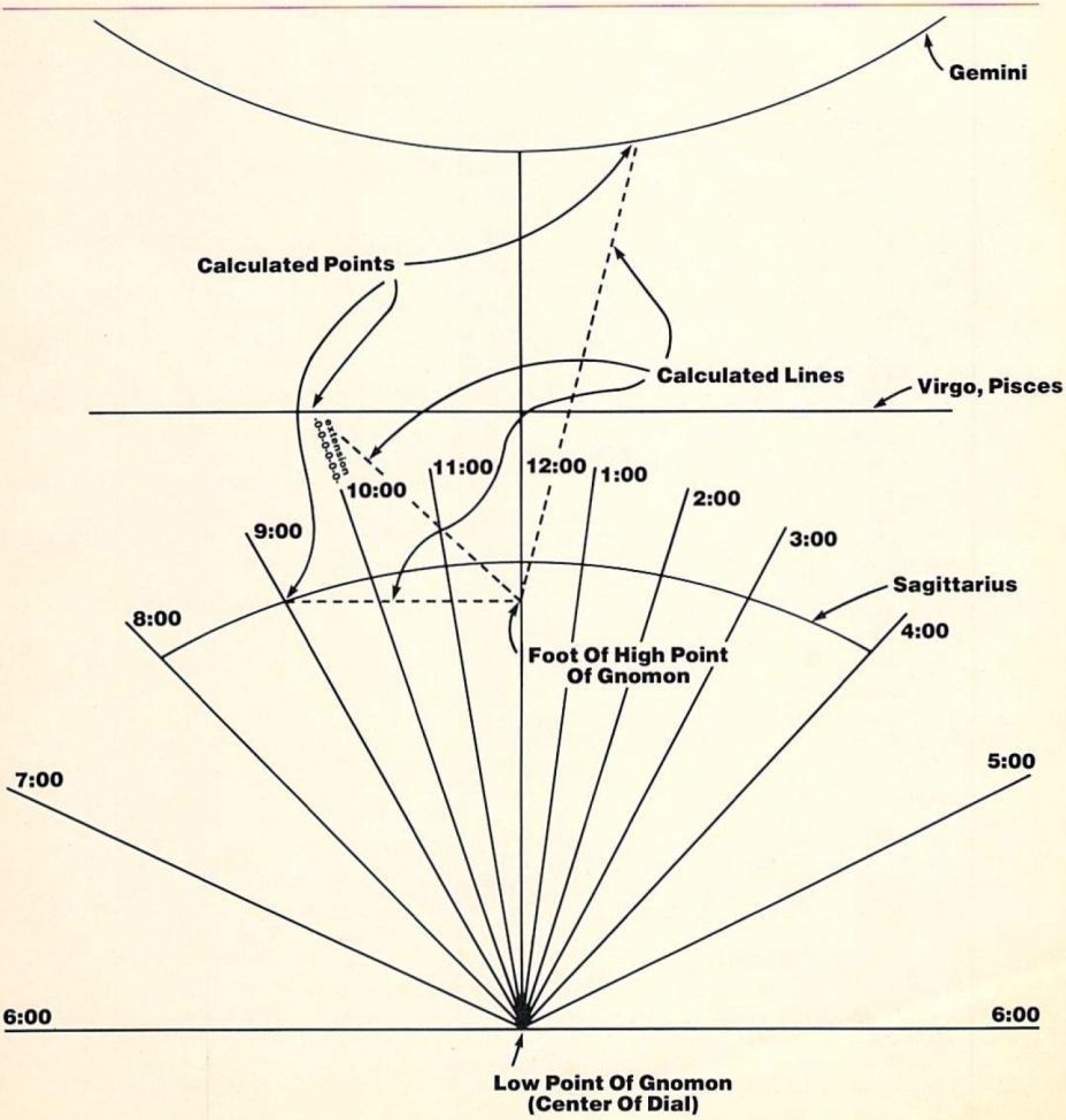
by Paul R. Machula

If you have ever wondered how the zodiac moves, this program may help you. It is designed to be a follow-up to my previous program "Sundial", which appeared in the Winter, 1983, issue.

Throughout the year the sun appears to pass through twelve constellations. If the sun were not so bright you would be able to actually see it travel through the sky with each of the constellations as a backdrop. The collective title of the twelve constellations is "zodiac." Using a sundial and the program "Zodiac" you will be able to use the sun's shadow to observe the sun's passage through the zodiacal constellations as represented on the face of the dial.

On an ordinary horizontal sundial the upper edge of the gnomon (known as the style) casts a shadow onto the hour lines to indicate the time. But, by using the shadow of the highest point of the gnomon we can also see how the sun travels through the zodiac.

If you were to observe the path of the shadow of the highest point of the gnomon on the shortest day of the year (winter solstice) you would see that the shadow's path traces out one portion of a hyperbola (bent away from the gnomon), and that it is at a fair distance from the perpendicular "foot" of the high point of the gnomon. A month later the sun's shadow, on a representative day, traces out a hyperbolic path that is closer to the gnomon. On the day of the vernal equinox (and the autumnal equinox) the path is a straight line. One month later the path is again hyperbolic, but still closer to the gnomon. Also, the path is bent in towards the gnomon. On the day of the summer solstice the shadow's path is a hyperbola very close to the foot of the gnomon. Using "Zodiac" you can calculate the points, measured from the foot of the high point of the gnomon out to the hour lines of the dial, through which the hyperbolae (and the straight lines of the equinoxes) can be traced.


Gemini
Calculated Points
Calculated Lines
Virgo, Pisces
extension
-0-0-0-0-0-0-
11:00
12:00
1:00
10:00
2:00
9:00
3:00
Sagittarius
8:00
4:00
Foot Of High Point
Of Gnomon
5:00
7:00
6:00
6:00
Low Point Of Gnomon
(Center Of Dial)

When you RUN "Zodiac" you will first be asked for the latitude of the location of the dial. Second, you will be asked for the height of the style. It is important to realize that this height is the height of the perpendicular line drawn from the highest point of the gnomon to the face of the dial. This is called the "perpendicular style." It can be measured in inches, centimeters, etc.

Next the program will give you the values of the times calculated (e.g., 12:00, 11:30, 11:00, etc.). It should be noted that these time values are actually applicable to two time values: that is, 11:30 is also 12:30; 11:00 is also 1:00; 10:30 is also 1:30, etc. To the right of the time values will be found numbers. The numbers stand for the lengths of straight lines that must be measured from the foot of the perpendicular style out to the points where they cross the corresponding hour lines.

The points found by this procedure mark the points at which the hyperbola crosses on the date the sun enters that particular constellation. The constellation for which these values are calculated appears on the screen as a heading. Negative values should be ignored.

You will find that the first constellation is Gemini. The values given are those for when the sun enters Gemini. Next on the screen will appear the values for two constellations: Cancer and Taurus. The values indicated here are needed for both of these constellations. The sun's shadow traces the same path on both of these dates. All necessary dates (constellations) and values are presented when the program is RUN.

When you RUN "Zodiac" you will also find that the values scroll off the screen. You should use the RUN/STOP key in connection with the command CONT in order to stop the scrolling. This will enable you to copy the values desired. If you have access to a printer you may wish to add printer commands to the program in order to have a "hard copy" of the necessary values.

As a final note, the constellations in this program are those through which the sun actually passes on the particular dates. They are not applicable to astrological considerations. **C**

Zodiac

```
1 REM****ZODIAC****BY PAUL MACHU
  LA***GLOBE, AZ***AUG 1983
2 PRINT"[CLEAR]"
3 PRINT "[DOWN6,RIGHT3]
  *****ZODIAC*****"
4 FOR X=1 TO 10^3.5:NEXT
5 PRINT"[CLEAR]":PRINT"ENTER THE
   LATITUDE OF THE DESIRED DIAL";
6 PRINT" (IN[SPACE2]
  DECIMAL DEGREES) AND[SPACE2]
  THE HEIGHT OF THE PER-PENDICUL
  AR STYLE BELOW"
7 PRINT
10 INPUT "LATITUDE=";A
11 PRINT
12 INPUT"HEIGHT=";S
   :FOR X=1 TO 1000:NEXT X
13 PRINT"[CLEAR]"
```

```
15 PRINT:PRINT:PRINT "TIME",
   " LENGTH":PRINT
19 PRINT "FOR GEMINI"
20 REM CONV DEG TO RAD
21 LET A1=A*[PI]/180
25 REM SUN DECLINATION VALUES
30 LET B=23.443*[PI]/180
31 GOTO 48
32 LET B=20.155*[PI]/180
33 GOTO 48
34 LET B=11.475*[PI]/180
35 GOTO 48
36 LET B=0
37 GOTO 48
38 LET B=-11.475*[PI]/180
39 GOTO 48
40 LET B=-20.155*[PI]/180
41 GOTO 48
42 LET B=-23.443*[PI]/180
43 GOTO 48
45 REM TIME VALUES IN RADIANS CO
   UNTER
48 LET C=-7.5*[PI]/180
49 REM BEGIN HOUR LOOP
50 FOR T=1 TO 12 STEP 1
51 IF T=1 THEN PRINT "12:00",
53 IF T=2 THEN PRINT "11:30",
55 IF T=3 THEN PRINT "11:00",
57 IF T=4 THEN PRINT "10:30",
59 IF T=5 THEN PRINT "10:00",
61 IF T=6 THEN PRINT "9:30",
63 IF T=7 THEN PRINT "9:00",
65 IF T=8 THEN PRINT "8:30",
67 IF T=9 THEN PRINT "8:00",
69 IF T=10 THEN PRINT "7:30",
71 IF T=11 THEN PRINT "7:00",
73 IF T=12 THEN PRINT "6:30",
80 REM INCREMENT TIME VALUES COU
   NTER
85 LET C=C+7.5*[PI]/180
86 REM CALCULATE LENGTH
87 LET X=COS(ATN(TAN(B)/COS(C)))
   *TAN(C)
88 LET Y=SIN(A1-(ATN(TAN(B)/COS(
   C))))
89 LET Z=X/Y
90 LET D=COS(ATN(Z))*1/TAN(A1-(A
   TN(TAN(B)/COS(C))))
91 PRINT 1/TAN(ATN(D))*S
95 REM END HOUR LOOP
100 NEXT T
105 REM PRINT NAMES OF CONSTELLA
    TIONS
110 IF B=23.443*[PI]
    /180 THEN PRINT "FOR CANCER
    AND TAURUS"
112 IF B=23.443*[PI]/180 THEN 32
120 IF B=20.155*[PI]
    /180 THEN PRINT "FOR LEO AND
     ARIES "
122 IF B=20.155*[PI]/180 THEN 34
130 IF B=11.475*[PI]
    /180 THEN PRINT "FOR VIRGO A
    ND PISCES"
132 IF B=11.475*[PI]/180 THEN 36
140 IF B=0 THEN PRINT "FOR LIBRA
     AND AQUARIUS"
142 IF B=0 THEN 38
150 IF B=-11.475*[PI]
    /180 THEN PRINT "FOR SCORPIO
     AND CAPRI-CORNUS"
152 IF B=-11.475*[PI]/180 THEN 40
160 IF B=-20.155*[PI]
    /180 THEN PRINT "FOR SAGITTA
    RIUS"
162 IF B=-20.155*[PI]/180 THEN 42
170 IF B=-23.443*[PI]
    /180 THEN 220
220 PRINT:PRINT:PRINT "*****THE
    [SPACE4]END*******"
```

The More-for-22 Subroutine

by Kenneth A. Parr

Avoid the limitations of the VIC's 22-column screen when you need to create columns of long numbers with identifying labels. A nifty trick with a variety of possible applications.

True or False?

A. A 40-character screen display is great.
B. An 80-character screen display is far better.
C. A 132-character screen display is absolutely stupendous!

A, B, and C may all be true. A, B, and C may all be false. Gauging the accuracy of these statements with only a 22-character VIC 20 screen display at my disposal is difficult (if not impossible), to say the least.

I can say, however, that I have experienced no significant problems with the smaller display.

Well, few significant problems.

Creating a column of numbers with identifying labels was troublesome for me. How could I display an identifying label and a number on the same line? The result usually was an identifying label too short for my tastes and room for a lengthy number, or an acceptable identifying label with a number no greater than double digits.

The "More-for-22" subroutine and its smaller satellite subroutines solved my problem. In addition to tallying a column of numbers, this subroutine accepts numbers to 999,999.99 and identifying labels of 18 characters on the same line.

How?

The identifying label and number are displayed on the same line, but not at the same time. A column of labels is listed first and after a delay, is replaced by the related numbers. In sequence, identifying labels flash on and off before being replaced on the same line by the number. Flashing before replacement helps focus the user's attention on the relationship between label and number.

How the Subroutine is Linked to the Main Program

The following "More-for-22" variables should be defined in your main program or another subroutine within your main program.

String Variables

J$ as color command BLUE.
K$ as color command RED.
M$ as color command BLACK.
A$ as each section heading read from DATA statements.
B$ (??) as each identifying label.
L$ as cursor command UP.
N$ as the printed version of numeric amounts.
P$ as command CLEAR screen.
R$ as the major heading. It should be centered and *must* be 22 characters long.
S$ as a blank variable, 21 characters long.

Numeric Variables

B (??) as each amount.
P as the subscript for each input record of the entire file.
Q as a pointer for the first input record of the section.
R as the subscript for each input record of the section.
U as an indicator switch. The switch ON (U = 1) means the updating of a record is complete, therefore it is okay to perform another type of processing. For example: IF U=1 THEN PRINT a total for a section in RED. The switch OFF (U = 0) means updating is not complete.

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INPUT# and PRINT# File

Each element of the arrays B$(??) and B(??) makes up one record when used with the same subscript. Eleven records make up a section and B(10) of the eleventh and last record of the section contains the section's total amount. B$(10) is left blank. Note: it is important that B$(10) or the last B$(??) of a section be left blank. Otherwise the subroutine will crash.

Fewer than 11 records may be used per section, but I recommend no more than 11. A minimum of 11 records will prevent a crowded screen display while allowing room for a prompt below the section's total amount.

The Satellite Subroutines

Subroutine on line 7: Long delay.
Subroutine on line 9: Short delay.
Subroutine on lines 32-52: Align decimal points and include a comma for amounts over 999.99.
Subroutine on lines 800-815 (Optional): Automatically center and make R$ 22 characters long:

```
800 IFLEN(R$)=>22THENR$=
   LEFT$(R$,22):RETURN
805 R$=R$+“ ”:IFLEN(R$)=22THENRETURN
810 R$=“ ”+R$:IFLEN(R$)=22THEN RETURN
815 GOTO805
```

For example:

IF R$=“TOTALS TO DATE” before GOSUB 800
THEN
R$=“ TOTALS TO DATE ”after GOSUB 800

Subroutine Execution

LINES	
600	The subroutine status counter (Z) is initialized at zero and the screen is cleared.
605	PRINT 22-character major heading (R$) in REVERSE mode on the uppermost line of the screen display. PRINT section heading. IF the value of Z is equal to one THEN line 612, lines 615-622 and lines 625-650 will be skipped.
612	R is initialized at the value of Q and the total amount of the section (S) is initialized at zero.
615-622	PRINT S$ to blank the line of anything previously printed on the line and on this same line; PRINT B$(R). Add the related amount to S and increment R. This process will continue until a B$(R) is examined and found blank.
625-650	To give the N$ version of S placement on the same screen location, for every section and regardless of how many records, a FOR-NEXT loop compensates for variations by printing extra blank lines. Upon completion of the loop, the element of the number array containing the section total B(P − 1) is given the value of S. PRINT N$ version of S, but IF the updating of a record has been accomplished THEN PRINT N$ version of S in RED.
700	The number of times B$(S) will flash on and off (C) is initialized at zero. Note: Value of R will indicate the number of records in the section and S, no longer needed for tallying amounts, becomes the subscript.
720-730	PRINT S$ before a short delay. On the same line, PRINT B$(S) before a short delay. This process is performed four times and causes the flashing effect.
733	B$(S) is removed from the screen one character at a time. Once B$(S) is completely gone, PRINT N$ version of B(S) where B$(S) was. Subroutine execution

will GOTO line 700 IF there are more records in the section.

766-769 Increment Z by one. The goal of the subroutine has been met IF Z is greater than two or the section was not divided into identifying labels (R = Q). There is a long delay. IF the goal of the subroutine has not been met THEN subroutine execution will GOTO line 605. **C**

More-for-22

```
7 FOR L=0 TO 4500:NEXT:RETURN
9 FOR L=0 TO 230:NEXT:RETURN
32 N=INT(N*100+.5)/100:E$=STR$(N)
   :L=LEN(E$):IF L-1<2 THEN 40
36 IF MID$(E$,L-1,1)="."THEN L=L
   -2:E$=E$+"0":GOTO 42
38 IF MID$(E$,L-2,1)="."THEN L=L
   -3:GOTO 42
40 E$=E$+".00"
42 C=1:N$=RIGHT$(E$,3)
44 IF L<2 THEN 50
46 IF C>3 THEN N$=","+N$:C=1
48 N$=MID$(E$,L,1)+N$:C=C+1:L=L-1
   :GOTO 44
50 IF LEN(N$)>9 THEN RETURN
52 N$=" "+N$:GOTO 50
600 Z=0:PRINT P$
605 PRINT CHR$(19)CHR$(18)J$R$
    :PRINT M$A$J$:IF Z=1 THEN 700
612 R=Q:S=0
615 GOSUB 9:PRINT S$L$
    :PRINT"[SPACE3]"B$(R)J$
    :S=S+B(R):R=R+1
    :IF B$(R)=""THEN 625
622 GOTO 615
625 PRINT M$"----------"J$
    :FOR C=R TO P:PRINT:NEXT
    :R=R-1:B(P-1)=S:N=S:GOSUB 32
636 IF U THEN N$=K$+N$
640 PRINT TAB(11)N$
    :PRINT TAB(11)M$"========== "
650 GOTO 766
700 FOR S=Q TO R:N=B(S):GOSUB 32
    :C=0
720 PRINT S$L$J$:GOSUB 9
    :PRINT"[SPACE3]"B$(S)L$
    :GOSUB 9:C=C+1:IF C>3 THEN 7
    33
730 GOTO 720
733 FOR C=1 TO LEN(B$(S))+3
    :GOSUB 9:PRINT TAB(C)" "L$
    :NEXT:PRINT N$J$:NEXT
766 Z=Z+1:IF Z>2 OR R=Q THEN RET
    URN
769 GOSUB 7:GOTO 605
```

Poem Writer

by Jim Gracely

Create random poems on your computer. You may not win a Pulitzer prize, but you'll have fun.

Here is a short program that will write original(?) open-form poems. The question mark is to raise the question of whether these poems can truly be called original. There are 91 words contained in the DATA statements. These words are grouped into nine different English speech parts. The program decides which words from each group will be combined to make a poem and then adds punctuation.

Now, I picked the 91 words and programmed how the poem will be constructed; I even programmed where the punctuation marks will appear, When the program runs, it follows my rules and creates a poem. Is it original?

Originality is determined by whether one thing is a copy or imitation of another. When this program writes a poem it isn't imitating anything else, and once you read a couple of the poems you will be certain it isn't copying anything else! In fact, it is very unlikely that the program will *ever* even imitate itself. Using a little bit of probability theory, I found that this program has the ability to write over 53 billion different poems!

Using that figure of 53 billion possible poems, I can say that the odds against my ever writing the same poem as the program are 53 billion to one. It seems to me that the poems this program writes are definitely original.

The Program

The program is divided into three parts:

Lines 10-60: These lines dimension the word array and then read the data statements to fill it. They also count the number of words in each group of data statements and store that value in array A.

Lines 100-900: These lines contain the words for the poem. The nine groups of words are each contained within one hundred line numbers (100-199, 200-299...). Words can be added or subtracted from these groups without changing the rest of the program (unless you put more than 35 words in one group). The only rule is that the last word in each group must be the word "end". Here are the parts of speech for each group:

Lines 100-199: Adverbs

Lines 200-299: Pronouns

Lines 300-399: Active verbs—past tense

Lines 400-499: Prepositions or prepositional phrases

Lines 500-599: Articles (add an adjective if you want)

Lines 600-699: Nouns

Lines 700-799: Passive verbs—past tense

Lines 800-899: Conjunctions and introductory adverbs

Lines 900-979: Pronouns (best if different from 200-299)

Some of these groups have unusual names. Either use the words already in the data statements as a guide or find some smart English teacher (personally, I had to rely on our editor, Diane).

Lines 980-1070: These lines construct a poem. They choose the words to use and insert the punctuation.

Lines 2000-2060: These lines print the poem to the screen and prompt you to either continue or to print out the poem.

This program is mostly for enjoyment. I had considered having the program write a book of poems but once everyone read them my hopes were shattered. Here are a couple of examples of what to expect (these are a couple of my favorites from about 25 that I printed).

Softly,
We ran over the river.
You talked,
But he smiled.
Quietly,
They jumped towards a large car.
A Boy Scout troop whispered,
Nevertheless I danced.

Without thinking,
My dog Spot sailed right at a big fruit stand.
A Boy Scout troop cried,
And the world helped.
Painfully,
We blew towards a small bus.
I sang,
And the sun talked.

Poem Writer

```
10 PRINT"[CLEAR]"
20 DIM W$(9,35)
30 FOR Z=1 TO 9
40 READ W$:IF W$="END"THEN A(Z)=X
   :X=0:GOTO 60
50 W$(Z,X)=W$:X=X+1:GOTO 40
60 NEXT
100 DATA SLOWLY,QUIETLY,QUICKLY,
    SOFTLY,SECRETLY,RAPIDLY,
    SWIFTLY,CAREFULLY,HAPPILY
110 DATA STUPIDLY,CAUTIOUSLY,
    PAINFULLY,WITH GREAT CARE,
    JOYFULLY
120 DATA CAUTIOUSLY,
    WITHOUT THINKING,PATIENTLY,
    SADLY,END
200 DATA I,YOU,WE,THEY,
    AN OLD ENGLISHMAN,
    A BOY SCOUT TROUP
210 DATA MY FRIENDS AND I,
     MY DOG SPOT,END
300 DATA WALKED,RAN,FLEW,SAILED,
    BLEW,JOGGED,PRANCED,JUMPED,
    WOBBLED,END
400 DATA AT,TOWARDS,OVER,UNDER,
    THROUGH,AROUND,NEAR,RIGHT AT,
    END
500 DATA A,THE,A BIG,A SMALL,
    A SMELLY,A SOFT,A LARGE,
    A LOUD,END
600 DATA STAIRWAY,BUILDING,
    BRIDGE,RESAURANT,
    DEPARTMENT STORE,HOUSE,
    APARTMENT,RIVER
610 DATA CHAIR,CAR,BUS,BANANA,
    FRUIT STAND,BEAUTIFUL LADY,
    DOG,END
700 DATA WAITED,WHISPERED,TALKED,
    HELPED,CRIED,DANCED,WEPT,
    SMILED,FROWNED,SANG,END
800 DATA AND,BUT,NEVERTHELESS,
    BUT IN THE END,
    AND BEFORE LONG,MEANWHILE,END
900 DATA I,THE SUN,THE WORLD,
    EVERYONE,EVERYONE EXCEPT ME,
    HE,SHE,IT,THEY,END
980 DATA 1,2,3,4,5,6,2,7,8,9,7
990 FOR X=0 TO 10:READ T(X):NEXT
1000 PRINT"[CLEAR]":S$=""
     :FOR X=0 TO 10
1010 T=T(X)
1020 R=INT(RND(0)*A(T))
1030 S$=S$+W$(T,R)
1040 IF X=0 OR X=7 THEN S$=S$+",
     "+CHR$(13)
1050 IF X=5 OR X=10 THEN S$=S$+"
     ."+CHR$(13)
1060 S$=S$+" "
1070 NEXT
2000 PRINT S$:PRINT"[DOWN5]"
2010 IF C=1 THEN C=0:PRINT#4
     :CLOSE 4:GOTO 1000
2020 PRINT"[RVS]PRESS SPACE TO C
     ONT[RVOFF]"
2030 PRINT"[DOWN,RVS]
     PRESS F1 TO PRINT[RVOFF]"
2040 GET A$:IF A$<>" "AND A$<>"
     [F1]"GOTO 2040
2050 IF A$=" "GOTO 1000
2060 OPEN 4,4:CMD 4:C=1:GOTO 2000
```

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Stompers
A Game for the Commodore 64

by Steve Proper

Use your joystick to control Fred, whose job it is to collect four keys—before he gets stomped. But be sure to avoid the bananas, cherries and blueberries or you'll end up as fruit salad. More detailed instructions are contained within the program.

Stompers

```
1 REM ***STOMPERS --- BY STEVE PROPER***
10 PRINT"[WHITE,CLEAR]":POKE 53280,0:POKE 53281,0
   :GOSUB 2000
20 IF PEEK(12296)<>231 THEN GOSUB 3000:GOTO 840
25 IF PEEK(12296)<>231 THEN GET A$:IF A$=""THEN 25
30 POKE 54296,79:DIM F(4),N(256),O(4),C(4):DL=50:VU=79
   :K4=300:POKE 12296,231
40 RESTORE:GOTO 710
44 :
45 REM      GAME LOOP
46 :
50 FOR I=1 TO H:O(I)=P:IF K1>1 THEN O(2)=K1:O(4)=K1
60 IF K3=100 OR K3=45 THEN GOSUB 230
70 M=PEEK(56321):IF M<>255 THEN POKE P,32:P=P+N(M)
90 A=PEEK(P):IF A<>32 AND A<>1 THEN 250
100 POKE 1310,K2+17:POKE P+CO,15:POKE P,1:POKE F(I),32
110 IF F(I)>O(I)AND F(I)-20<O(I)THEN NM=-1:P2=10
120 IF F(I)<O(I)AND F(I)+20>O(I)THEN NM=1:P2=11
130 IF F(I)+20<O(I)THEN NM=40:P2=9
140 IF F(I)-20>O(I)THEN NM=-40:P2=8
150 F(I)=F(I)+NM
160 IF PEEK(F(I))=2 THEN F(I)=F(I)-NM
170 IF PEEK(F(I))>2 AND PEEK(F(I))<12 AND PEEK(F(I)+NM)<>
    2 THEN F(I)=F(I)+NM:GOTO 170
180 POKE F(I)+CO,C(I):POKE F(I),P2
190 IF F(I)=P THEN 670
200 IF F(I)=K1 THEN K1=0:K3=35
210 K3=K3+1:POKE S+4,17:POKE S+4,238:NEXT I
    :IF VAL(TI$)<K4 THEN GOTO 50
215 IF VAL(TI$)<K4+5 THEN A=INT(RND(TI)*255):POKE 53280,A
    :POKE 53281,A:GOTO 50
216 K2=6:GOTO 365
```

```
219 :
220 REM            KEYS
222 :
230 IF K3=100 THEN K3=40:POKE K1,32:K1=0:RETURN
240 GOSUB 330:K1=LK:POKE K1,12:POKE K1+CO,7:K5=K5+1:RETURN
244 :
245 REM         SPEED CHECKS
246 :
250 IF A=5 THEN POKE P+CO,7:GOTO 316
260 IF A=4 THEN POKE P+CO,2:GOSUB 353:POKE P+CO,0:P=P-N(M)
265 IF A=4 THEN B=INT(RND(TI)*10):IF B=1 THEN A=8
270 IF A>7 AND A<12 THEN 670
275 IF A=7 THEN POKE P+CO,4:GOTO 354
280 IF A=6 THEN POKE P+CO,8:GOSUB 356:POKE P+CO,0:P=P-N(M)
285 IF A=2 THEN GOSUB 357
290 IF P=K1 THEN K2=K2+1:K3=40:H=H-1:IF K2=4 THEN 630
295 IF P=K1 THEN FOR A=50 TO 5 STEP-5:POKE S,A:POKE S+1,A
    :POKE S+4,19:POKE S+4,18:NEXT
300 IF A=3 THEN 351
310 GOSUB 350:GOTO 100
314 :
315 REM         INDICATORS
316 :FOR Z=75 TO 175 STEP 8:POKE S,Z:POKE S+1,Z
    :POKE S+4,19:POKE S+4,18:NEXT
317 P=P-N(M):IF PEEK(P-N(M))=32 THEN POKE P,1
    :FOR SL=1 TO 5:NEXT:POKE P,32:GOTO 317
318 GOTO 310
320 FOR SL=1 TO 500:NEXT:RETURN
330 LK=INT(RND(TI)*25)*40+INT(RND(TI)*25)+9:LK=LK+1023
    :IF PEEK(LK)<>32 THEN 330
340 RETURN
350 POKE S,230:POKE S+1,20:POKE S+5,9:POKE S+24,VU:RETURN
351 POKE P+CO,9:FOR Z=1 TO 255 STEP 20:POKE S,Z:POKE S+1,Z
    :POKE S+4,19:POKE S+4,18:NEXT
352 FOR Z=255 TO 1 STEP-20:POKE S,Z:POKE S+1,Z:POKE S+4,19
    :POKE S+4,18:NEXT:K2=5:GOTO 365
353 POKE S+5,120:POKE S+4,18:POKE S+4,19:POKE S,5
    :FOR B=1 TO 300:NEXT:RETURN
354 FOR Z=50 TO 1 STEP-3:POKE S+4,130:POKE S+1,Z
    :POKE S+4,131:NEXT Z
355 GOSUB 330:P=LK:GOTO 310
356 POKE S+4,18:FOR A=20 TO 40:POKE S+4,19:POKE S+4,131
    :POKE S,A:POKE S+1,A:NEXT:RETURN
```

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```
357 FOR A=1 TO 53:POKE S+5,0:POKE S,A:POKE S+1,A
    :POKE S+4,19:POKE S+4,18:NEXT
358 FOR A=VU TO 64 STEP-1:POKE S+24,A:POKE S+5,0
    :POKE S+1,53:POKE S+4,19:POKE S+4,18:NEXT
359 K2=0:H=4:P=P-N(M):RETURN
364 :
365 REM         PRINTOUT
366 :
390 GOSUB 320:PRINT"[CLEAR]":POKE 53272,21
    :POKE 53270,PEEK(53270)AND 239
395 POKE 53280,0:POKE 53281,0:IF K2=6 THEN PRINT"YOUR
    [SPACE]OUT[SPACE]OF[SPACE]TIME[SPACE]!!":LO=LO+1
400 IF K2=5 THEN PRINT"YOU[SPACE]FOUND[SPACE]THE[SPACE]
    LUCKY[SPACE]PENNY[SPACE]!!":WI=WI+1:DL=DL+5
410 IF K2<4 THEN PRINT"YOU[SPACE]TOOK[SPACE]";K2"OF[SPACE]
    THE[SPACE]4[SPACE]KEYS":LO=LO+1
420 IF K2=0 THEN PRINT"PERHAPS[SPACE]A[SPACE]LOWER[SPACE]
    LEVEL[SPACE2]OF[SPACE]PLAY..."
430 IF K2=1 THEN PRINT"ONES[SPACE]BETTER[SPACE]THEN[SPACE]
    NONE[SPACE]!"
440 IF K2=2 THEN PRINT"YOU[SPACE]WERE[SPACE]HALF[SPACE]
    WAY[SPACE]THEIR[SPACE]!"
450 IF K2=3 THEN PRINT"3[SPACE]OUT[SPACE]OF[SPACE]4[SPACE]
    ISNT[SPACE]BAD[SPACE]!"
460 IF K2=4 THEN PRINT"YOU[SPACE]TOOK[SPACE]ALL[SPACE]
    FOUR[SPACE]!"
470 IF K2=4 THEN PRINT"NEXT[SPACE]TIME[SPACE]WE'LL[SPACE]
    STOP[SPACE]YOU...":DL=DL+5:WI=WI+1
480 PRINT"---------------------------------------"
490 GET A$:IF A$<>""THEN 490
500 PRINT"-DIFFICULTY[SPACE]LEVEL:";DL;"TIME[SPACE]LIMIT
    :";K4/100
510 PRINT"[DOWN]-WINS:";WI;"LOSSES:";LO
520 PRINT"[DOWN]-TOTAL[SPACE]GAMES[SPACE]PLAYED:";WI+LO
530 PRINT"[DOWN]-[RVS]F1[RVOFF,SPACE]TO[SPACE]END[SPACE]
    THE[SPACE]GAME"
535 PRINT"[DOWN]-[RVS]F2[RVOFF,SPACE]VOLUME[SPACE]
    DECREASE/INCREASE"
540 PRINT"[DOWN]-[RVS]F3[RVOFF,SPACE]TO[SPACE]DECREASE
    [SPACE]DIFFICULTY[SPACE]LEVEL"
545 PRINT"[DOWN]-[RVS]F4[RVOFF,SPACE]TO[SPACE]INCREASE
    [SPACE]DIFFICULTY[SPACE]LEVEL"
550 PRINT"[DOWN]-[RVS]F5[RVOFF,SPACE]TO[SPACE]SET[SPACE]
    TIME[SPACE]LIMIT"
```

```
560 PRINT"[DOWN]-[RVS]FIRE[RVOFF,SPACE]BUTTON[SPACE]OR
    [SPACE,RVS]SPACE[RVOFF,SPACE]TO[SPACE]PLAY[SPACE]
    AGAIN[SPACE]![DOWN]"
570 GET A$:IF A$="[F1]"THEN POKE S,0:POKE S+1,0
    :PRINT"[CLEAR]":END
571 IF A$=""THEN A$="[SPACE]"
572 IF ASC(A$)>133 AND ASC(A$)<140 THEN PRINT"[SPACE37,UP]
    "
574 IF A$="[F5]"THEN 4000
579
580 IF A$="[F2]"THEN VU=VU-1:IF VU<64 THEN VU=79
590 IF A$="[F2]"THEN POKE S+24,VU:PRINT"VOLUME
    :";VU-64;"[UP]"
600 IF A$="[F3]"AND DL>5 THEN DL=DL-5
605 IF A$="[F4]"AND DL<100 THEN DL=DL+5
606 IF A$="[F4]"OR A$="[F3]"THEN PRINT"DIFFICULTY[SPACE]
    LEVEL:";DL;"[UP]"
610 IF PEEK(56321)=239 THEN K1=0:K2=0:GOTO 40
620 A=INT(RND(TI)*255)+1:POKE S,A:POKE S+1,A:POKE S+4,19
    :POKE S+4,18:GOTO 570
624 :
625 REM   LOSSER/WINNER
626 :
630 POKE P+CO,1:POKE 1310,21:FOR I=1 TO 4:POKE F(I),32
    :NEXT:POKE P,1:FOR I=1 TO 12
640 FOR Z=70 TO 150 STEP 20:POKE S,Z:POKE S+1,Z
    :POKE S+4,19:POKE S+4,18:NEXT Z,I:GOTO 365
670 FOR I=255 TO 1 STEP-5:POKE S+4,19:POKE S+4,18:POKE S,I
    :POKE S+1,I:NEXT:POKE S+5,200
680 POKE S+4,130:POKE S+4,131:POKE P,22:FOR SL=1 TO 95
    :NEXT:POKE S+5,9:POKE P+CO,0
690 FOR A=1 TO 24:B=INT(RND(TI)*255)
    :POKE 12464+INT(RND(TI)*8),B
695 POKE 53280,A:POKE 53281,A:FOR SL=1 TO 20:NEXT SL,A
700 FOR I=1 TO 8:POKE 12464+I,0:NEXT:GOTO 365
704 :
705 REM       SET UP
706 :
710 POKE 53265,PEEK(53265)AND 239:S=54272:FOR L=0 TO 23
    :POKE S+L,0:NEXT
720 POKE S,230:POKE S+1,20:POKE S+5,9:POKE S+22,104
    :POKE S+23,1
730 PRINT"[CLEAR,WHITE]":RESTORE:POKE 53272,
    (PEEK(53272)AND 240)+12:P=1524
```

```
740 H=4:C=4:CO=54272:K3=0
750 FOR I=1 TO 4:READ A:F(I)=A:NEXT
    :DATA 1084,1964,1513,1535
760 FOR I=1 TO 8:READ A,D:N(A)=D:NEXT
770 DATA 254,-40,253,40,251,-1,247,1,250,-41,246,-39,249,
    39,245,41
780 FOR I=1 TO 4:READ A:C(I)=A:NEXT I:DATA 2,5,14,8
790 FOR Z=1032 TO 1055:POKE Z+CO,15:POKE Z,2
    :POKE Z+CO+960,15:POKE Z+960,2:NEXT
800 FOR Z=1032 TO 1994 STEP 40:POKE Z+CO,15:POKE Z,2
    :POKE Z+24+CO,15:POKE Z+24,2:NEXT
810 FOR I=1 TO 4:FOR Z=1 TO DL/4:GOSUB 330:POKE LK,3+I
    :POKE LK+CO,0:NEXT Z,I
820 PRINT"[DOWN,SPACE6]M[DOWN,LEFT]N[DOWN,LEFT]O[DOWN,
    LEFT]P[DOWN,LEFT]:"
825 IF INT(RND(TI)*5)+1=1 THEN GOSUB 330:POKE LK,3
    :POKE LK+CO,0
830 POKE 53265,PEEK(53265)OR 16:POKE P,1:TI$="000000"
    :GOTO 50
834 :
835 REM      CUSTOM CHARACTER
836 :
840 POKE 52,48:POKE 56,48:CLR
850 POKE 56334,PEEK(56334)AND 254
860 POKE 1,PEEK(1)AND 251
870 FOR I=0 TO 511:POKE I+12288,PEEK(I+53248):NEXT
880 POKE 1,PEEK(1)OR 4
890 POKE 56334,PEEK(56334)OR 1
900 RESTORE
910 READ A:IF A<>1134 THEN 910
920 FOR I=12296 TO 12471:READ A:POKE I,A:NEXT
    :PRINT TAB(9)"[RVS,SHFT P,SHFT R,SHFT E,SHFT S2,SPACE,
    SHFT A,SHFT N,SHFT Y,SPACE,SHFT K,SHFT E,SHFT Y,SPACE,
    SHFT T,SHFT O,SPACE,SHFT P,SHFT L,SHFT A,SHFT Y,UP]"
930 GOTO 25
1000 DATA 1134,0,66,66,126,195,126,102,195,126,126,126,
     126,126,126,0,0
1010 DATA 0,60,66,153,153,82,60,0,6,9,8,60,110,86,126,60
1015 DATA 8,24,48,96,96,96,48,24
1020 DATA 0,60,106,213,171,86,60,0
1025 DATA 0,24,60,126,126,60,24,0
1030 DATA 66,165,0,231,195,195,231,66,66,231,195,195,231,
     0,165,66
1040 DATA 94,159,83,0,0,83,159,94,122,249,74,0,0,74,249,122
```

```
1050 DATA 124,130,124,48,48,60,48,60,102,108,96,96,108,
     102,99,0
1060 DATA 124,64,64,112,64,64,124,0,36,36,36,36,60,4,4,60
1070 DATA 0,126,64,64,126,2,2,126,0,60,66,0,66,66,60,0
1080 DATA 0,24,24,24,0,24,24,24,0,60,2,2,60,64,64,61
1090 DATA 0,124,2,2,124,2,2,124,0,66,66,66,60,2,2,2,,,,,,,
     ,
1094 :
1095 REM                BANNER
1096 :
2000 A$="[BLACK,WHITE,RED,CYAN,MAGENTA,GREEN,BLUE,YELLOW,
     ORANGE,BROWN,L. RED,GRAY 1,GRAY 2,L. GREEN,L. BLUE,
     GRAY 3]":FOR I=1 TO 16:PRINT MID$(A$,I,1)
2010 PRINT"[HOME,SPACE,RVS,SPACE3,RVOFF,SPACE,RVS,SPACE3,
     RVOFF,SPACE,RVS,SPACE3,RVOFF,SPACE,RVS,SPACE5,RVOFF,
     SPACE,RVS,SPACE3,RVOFF,SPACE,RVS,SPACE3,RVOFF,SPACE,
     RVS,SPACE3,RVOFF,SPACE2,RVS,SPACE3,RVOFF,SPACE,RVS,
     SPACE,RVOFF]"
2020 PRINT"[SPACE,RVS,SPACE,RVOFF,SPACE4,RVS,SPACE,RVOFF,
     SPACE2,RVS,SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE,
     RVS,SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE,RVS,
     SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE,RVS,SPACE,
     RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE3,RVS,SPACE,RVOFF,
     SPACE2,RVS,SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE3,
     RVS,SPACE,RVOFF]"
2030 PRINT"[SPACE,RVS,SPACE3,RVOFF,SPACE2,RVS,SPACE,RVOFF,
     SPACE2,RVS,SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE,
     RVS,SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE,RVS,
     SPACE,RVOFF,SPACE,RVS,SPACE3,RVOFF,SPACE,RVS,SPACE2,
     RVOFF,SPACE2,RVS,SPACE3,RVOFF,SPACE2,RVS,SPACE3,
     RVOFF,SPACE,RVS,SPACE,RVOFF]"
2040 PRINT"[SPACE3,RVS,SPACE,RVOFF,SPACE2,RVS,SPACE,RVOFF,
     SPACE2,RVS,SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE,
     RVS,SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE,RVS,
     SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE3,RVS,SPACE,
     RVOFF,SPACE3,RVS,SPACE,RVOFF,SPACE2,RVS,SPACE,RVOFF,
     SPACE3,RVS,SPACE,RVOFF]"
2050 PRINT"[SPACE,RVS,SPACE3,RVOFF,SPACE2,RVS,SPACE,RVOFF,
     SPACE2,RVS,SPACE3,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE,
     RVS,SPACE,RVOFF,SPACE,RVS,SPACE,RVOFF,SPACE,RVS,
     SPACE,RVOFF,SPACE3,RVS,SPACE3,RVOFF,SPACE,RVS,SPACE,
     RVOFF,SPACE2,RVS,SPACE,RVOFF,SPACE,RVS,SPACE3,RVOFF,
     SPACE,RVS,SPACE,RVOFF]"
2060 PRINT"[DOWN,SPACE6]REQUIRES[SPACE,RED]25[WHITE,SPACE]
```

```
     SECOND[SPACE]SET[SPACE]UP"
2070 NEXT:RETURN
2080 :
2085 REM         INSTUCTIONS
2090 :
3000 PRINT CHR$(14);"[CLEAR,SHFT I]NSTRUCTIONS:[DOWN]"
3010 PRINT"[SHFT U]SE[SPACE]JOYSTICK[SPACE]IN[SPACE]PORT
     [SPACE]1[SPACE]TO[SPACE]CONTROL[SPACE,SHFT F]RED.
     [SPACE]"
3020 PRINT"[CMDR Q,CMDR W]ITTING[SPACE]A[SPACE,SHFT O]
     RANGE,[SHFT C]HERRY,[SHFT B]LUEBERRY,OR[DOWN]"
3030 PRINT"[SHFT B]ANNA[SPACE]IS[SPACE]DANGEROUS[SPACE]TO
     [SPACE]YOUR[SPACE]HEALTH![DOWN]"
3040 PRINT"[SHFT I]F[SPACE,SHFT F]RED[SPACE]SHOULD[SPACE]
     HIT[SPACE]A[SPACE,SHFT B]ANNA[SPACE]HE[SPACE]WILL
     [SPACE]SLIP."
3042 PRINT"[SHFT F]ALLING[SPACE]INTO[SPACE]A[SPACE,SHFT B]
     LUE[SHFT B]ERRY[SPACE]BLACK[SPACE]HOLE[DOWN]"
3043 PRINT"RESULTS[SPACE]IN[SPACE]A[SPACE]HYPERSTOMP.
     [DOWN]"
3045 PRINT"[SHFT H]ITTING[SPACE]A[SPACE,SHFT C]HERRY
     [SPACE,SHFT B]OMB[SPACE]RESULTS[SPACE]IN[SPACE]
     CHANCE[DOWN]"
3046 PRINT"OF[SPACE]EXPLOSION![SPACE,SHFT O]RANGES[SPACE]
     ARE[SPACE]SAFE.[DOWN]"
3050 PRINT"[SHFT H]ITTING[SPACE]THE[SPACE]WALL[SPACE]
     REVIVES[SPACE]ALL[SPACE]STOMPERS.[DOWN]"
3060 PRINT"[SHFT D]O[SPACE,SHFT N,SHFT O,SHFT T,SPACE]GET
     [SPACE]STOMPED[SPACE]ON[SPACE]![DOWN]"
3070 PRINT"[SHFT R]ETRIEVE[SPACE]ALL[SPACE]4[SPACE]KEYS
     [SPACE]BEFORE[SPACE]THE[SPACE]TIMES[SPACE]UP.":RETURN
3075 :
3080 REM TIMER SET UP
3085 :
4000 PRINT"[CLEAR]ENTER[SPACE]YOUR[SPACE]NEW[SPACE]TIME
     [SPACE]LIMIT:[SPACE3,LEFT3]";:A=0:C$=""
4005 GET B$:IF B$=""THEN B$="[SPACE]"
4010 B=ASC(B$):IF B<48 OR B>57 THEN 4005
4015 A=A+1:IF A=1 AND VAL(B$)>3 OR A=2 AND VAL(B$)>5 THEN
      A=A-1:GOTO 4005
4020 PRINT B$;:IF A=1 THEN PRINT":";
4025 C$=C$+B$:IF A<3 THEN 4005
4030 K4=VAL(C$):GOTO 390
```

How to Conference on CompuServe

by Tony Caramanico

Commodore's Assistant Telecommunications Coordinator explains how to participate successfully in an on-line conference on the CompuServe Information Service using your computer and modem.

Have you ever imagined 30 or more people holding a conference on cooking, sports, music, games or any of the numerous areas of the computer field? You say, "So what, that goes on every day all over the world." True, but can you imagine every one of these people participating in a conference in front of a computer terminal?

One of the special features the CompuServe Information Service (CIS) offers is conferencing, commonly known as CO to us CIS users. CIS conferencing offers the unique chance for all these people, located anywhere in the U.S. or Canada, to hold a conference on their computer terminal while sitting in their own home.

CO is a formal, organized, interactive discussion among two or more people at one time. You can hold a conference in a SIG (Special Interest Group) on CompuServe by entering CO at the FUNCTION prompt or FUNCTION MENU prompt. When you enter conference mode, a listing of COnference rules, etiquette and regulations will be displayed. The following is a brief transcript taken from one of our recent COs. Barbara Karpinski, SYSOP for the Commodore Information Network, is the monitor; Jeff Bruette, Neil Harris and Bill Hindorff, all from Commodore, are the guest speakers. Barry and Robert, Commodore users, are asking questions.

```
(31,Barbara Karpinski) (NUMBER 10) Ok, Barry
    u are up, .....
(31,Barbara Karpinski) please ask your question. ga
(31,Barry) Thanks, Barbara...
(31,Barry) I would like some recommendations...
(31,Barry) as to the three best arcade...
(31,Barry) style games for the C-64. ga
(31,Jeff Bruette) Wizard of Wor, Gorf, Blueprint. ga
(31,Neil Harris) Disk or cartridge games? ga
(31,Barry) Disk games
(31,Bill H) Commodore does not make disk
    arcade games. ga
(31,Jeff Bruette) Infocom adventures...
    Jumpman... Lode Runner. ga
(31,Barry) OK cartridge, then. ga
(31,Neil Harris) Bill H... ai agree, Jeff. thanks, ga
(31,Barbara Karpinski) Barry are u done?
(31,Barry) yes. ga
(31, Barbara Karpinski) Ok #14 please ask your
    question. ga
(31,Robert) I have a 1525 printer...
```

In the transcript above "(31,Barry)" designates, for instance, the channel Barry was tuned into and his handle. When you type your handle (name) it will appear exactly as entered. Note that you may enter conference mode at any time, but scheduled conference times along with guest speakers will be announced by online bulletins.

CO Etiquette

I feel that CO etiquette is one of the most important aspects of conducting a successful conference. It is important, first, to announce your entry. Please don't be a *lurker*!! Second, the generally accepted protocol is to type "..." (3 periods) to indicate you aren't done and type "GA" or "." to mean you are done and the other party should "go ahead". Lastly, all of our future COs will have specific topics; therefore it will be imperative that your question pertain to the subject area.

Commands

Please note that all of the following commands are used in conference mode and are always preceded by a / slash as the first character of the line.

/HAN: Changing your name (handle)

When conferencing, it is polite to use your real name. Whether you choose to use your last name is up to you. Your name, which is called your handle, can be changed at any time when in CO by using the /HAN command. To change your name, simply type /HAN followed by a <RETURN>. You will then be prompted with: "WHAT'S YOUR HANDLE?". Simply type in your name and then <RETURN> and your name will be changed.

/TUN: Tuning to another channel

After receiving your QUE # you will have to use the /TUNe command to enter the channel on which the conference is being held. Enter /TUN followed by the number. If you enter /TUN 22 for instance, you will then be tuned to channel 22 where you can then begin sending messages.

/TALK: Talk Command and Talk Requests

If you want to go into a private conversation with someone, you can do so by entering the /TALK command. To accomplish this you have to know the person's job number. The number is found in USTAT (see /UST command). If somebody requests to talk to you privately while on CO, you will see a message (please note that the up arrow indicates pressing the control key.):

```
***PLEASE /TALK with Job 77 [70007,356]
        Sysop/Tony Caramanico.
```

You would respond with the command: /TALK 77 followed by a <RETURN> and then you will receive:

```
      Job 77 [70007,356]
    Sysop/Tony Caramanico is
        now in contact
 (Use a ↑P to break contact)
```

If you wish to use the /TALK command to signal another user that you would like to talk with them privately, you would need to know their job number (see /UST command). Let's suppose their job number is 32. You would type: /TALK 32 followed by a <RETURN> and you will then be prompted with:

```
Job 32 has been notified, please wait
    (Use a ↑P to break contact)
```

When the person with whom you requested a /TALK responds, you will then receive the prompt:

```
Job 70 [70007,533] Barbara Karpinski
        is now in contact
   (Use a ↑P to break contact)
```

/UST: User Status

This command will list the job number, user I.D., node (where they are located), their channel, handle and whether they are in the /TALK mode. The following is displayed when this command is used:

```
Job    User ID      Nod  Ch  Tlk   Handle
 32  70007,356     FYL  30        Sysop/Tony Caramanico
 70  70007,533     FYL  30   *    Barbara Karpinski
110  70007,1052    SEA  30   *    Sysop/Betty Knight
122  70007,577     FRS  30        deb!
```

The asterisks in the "TLK" column designate that those users are in the /TALK mode. You can request the user statistics of a specific channel by designating that channel with the command /UST 30. If you do not designate the channel all users currently on will be displayed.

/EXI: Exiting from CO

You can exit from CO with the /EXI command, which will put you back at the FUNCTION prompt in the SIG from which you entered CO. You may also LOGOFF the system within CO (but not within /TALK mode) by entering the /OFF command.

There are many other commands available for conferencing. Just type /HELP when in CO and they will be displayed.

Control Characters

<CRTL> V: This will display the line you have typed but have not yet sent with the <RETURN> key. The display appears on your screen only. This can be very useful when many people are typing at once.

<CRTL> U: This will delete the entire line you just entered before it is transmitted with <RETURN>.

<CRTL> C: Exits the CO area and returns you to the SIG main menu or FUNCTION: prompt

<CRTL> P: This is used to abort the bulletin displayed during the CO entry. The next line you see is the same as the /STA. It is also used to abort the /TALK command.

<CRTL> O: Aborts the entry bulletin and the CO user status.

If you are unsure of how to use any of these commands you can probably get help from the other people in CO. There are many people who are very familiar with conferencing who will be happy to help. CO is meant to be fun to use, and is a good way of exchanging information.

CAUTION! Under no circumstances should you enter your password while in CO or TALK. If you see a prompt for USER ID or PASSWORD it's likely that someone has sent the prompts to you in an attempt to obtain your password and use your account. If this happens, DO NOT RESPOND! Instead, break contact with the person you are talking to and report it to CompuServe's Customer Service.

Successfulness

A successful CO is the ultimate goal of the SYSOPs and speakers conducting the CO. Since there is no verbal communication and everyone would like to voice (or I should say <ENTER> in this case) their views and questions, your computer screen can become quite confusing. When 30 people start entering all at once, a conference can become quite frustrating. This is where you and the conference monitors come into play. Before the CO begins, you will be given a QUE # (question #) and then you may either stay on that waiting channel or proceed to the channel where the actual CO is being held. A successfully organized CO can also be achieved if you, the participants, help us. What I mean by "helping us" is simply help us help other users who aren't familiar with conferencing and by not entering unwanted material into the actual CO channel. We hope you will join us on CompuServe in the future and attend one of the online conferences! **C**

Conferencing Commands

```
PREFIX COMMANDS WITH A "/"
/TUN # - TUNES CHANNEL # (1-36)
/TALK # - TALK PRIVATELY W/ JOB#
/MON 1,4 - LISTEN TO EXTRA CHNLS
/UNM 7,3 - UNMONITOR CHANNELS
/STA - TYPE CHANNEL STATUS
/TIM - TYPE TIME, DAY, AND DATE
/UST - USER STATUS TYPEOUT
/UST # - USER STATUS FOR CHN #
/EXI - EXIT CB SIMULATOR
/OFF - EXIT CB AND LOG OFF
/WHO - TYPE PPN OF LAST TALKER
/HAN - CHANGE HANDLE
/SCR XYZ - SCRAMBLE ON KEY "XYZ"
/SMC XYZ - SCR & MONITOR CLEAR
/XCL XYZ - XMT CLEAR; UNSCR RCVR
/UNS - UNSCRAMBLE (BOTH CLEAR)
/SQU ABC - SQUELCH HANDLE "ABC"
/SBU #,# - SQUELCH BY USER ID
/JOB - YOUR JOB #
/HELP - TYPE THIS MESSAGE
```

http://www.oldgamesitalia.net/ http://www.oldgamesitalia.net/

glitch fix

Winter, 1983

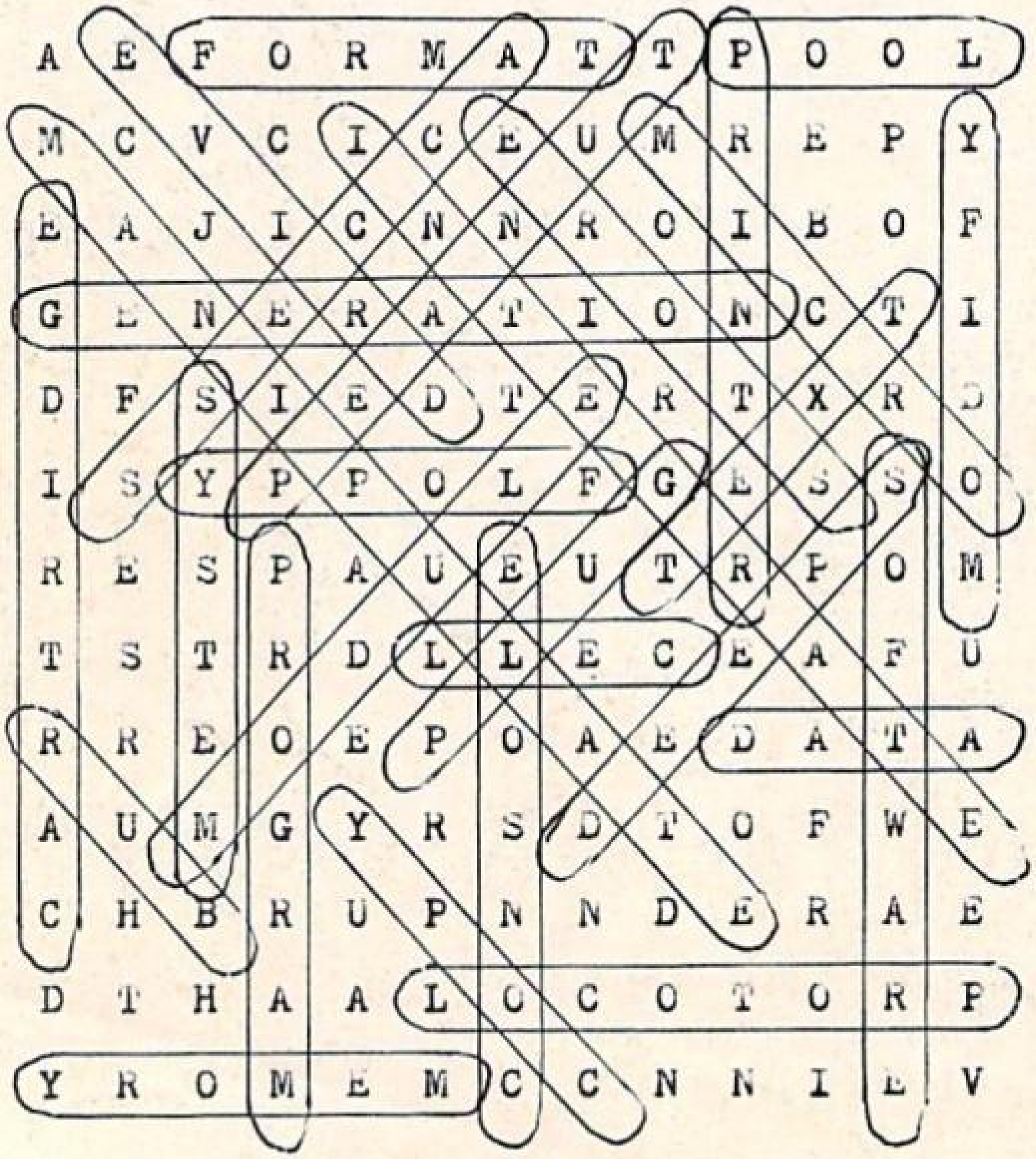
Page 32

Those of you who were confused by this page, take heart. You are not going batty. Instead of picking up an ad from the previous issue and placing it here, the printer accidentally picked up the old page 32 (see Fall). And we missed it in proofing. Sorry.

Computer Searchword

(Continued from page 103)

Key to Computer Searchword



A	E	F	O	R	M	A	T	T	P	O	O	L
M	C	V	C	I	C	E	U	M	R	E	P	Y
E	A	J	I	C	N	N	R	O	I	B	O	F
G	E	N	E	R	A	T	I	O	N	C	T	I
D	F	S	I	E	D	T	E	R	T	X	R	D
I	S	Y	P	P	O	L	F	G	E	S	S	O
R	E	S	P	A	U	E	U	T	R	P	O	M
T	S	T	R	D	L	L	E	C	E	A	F	U
R	R	E	O	E	P	O	A	E	D	A	T	A
A	U	M	G	Y	R	S	D	T	O	F	W	E
C	H	B	R	U	P	N	N	D	E	R	A	E
D	T	H	A	A	L	O	C	O	T	O	R	P
Y	R	O	M	E	M	C	C	N	N	I	E	V

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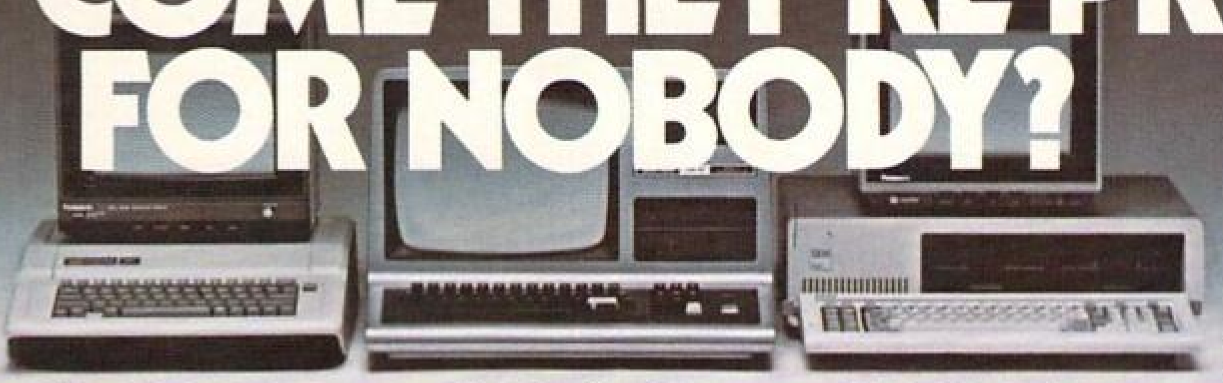
IF PERSONAL COMPUTERS ARE FOR EVERYBODY, HOW COME THEY'RE PRICED FOR NOBODY?



$1395* APPLE® IIe 64K

$999* TRS-80® III 16K

$1355* IBM® PC 64K

A personal computer is supposed to be a computer for persons. Not just wealthy persons. Or whiz-kid persons. Or privileged persons.

But person persons.

In other words, all the persons whom Apple, IBM, and Radio Shack seem to have forgotten about (including, most likely, you).

But that's okay. Because now you can get a high-powered home computer without taking out a second mortgage on your home.

It's the Commodore 64. We're not talking about a low-priced computer that can barely retain a phone number. We're talking about a memory of 64K. Which means it can perform tasks most other home computers can't. Including some of those that cost a lot more. (Take another look at the three computers above.)

By itself, the Commodore 64 is all the computer you'll ever need. Yet, if you do want to expand its capabilities some day, you can do so by adding a full complement of Commodore peripherals. Such as disk drives. Modems. And printers.

You can also play terrific games on the Commodore 64. Many of which will be far more challenging than those you could ever play on a game machine alone.

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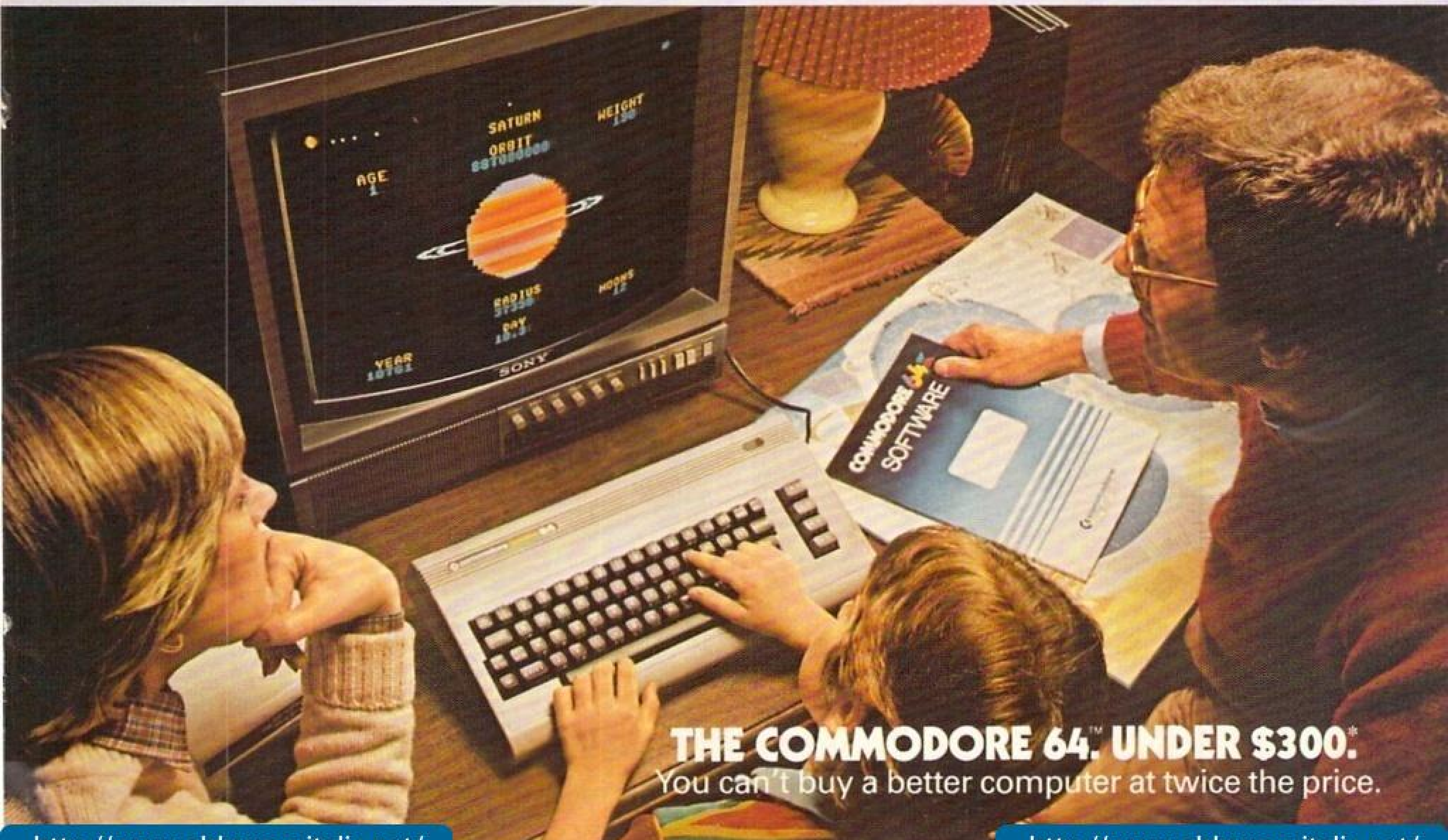
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